



Zootaxa 2956: 1–76 (2011)

www.mapress.com/zootaxa/

Copyright © 2011 · Magnolia Press

Monograph

ISSN 1175-5326 (print edition)

ZOOTAXA

ISSN 1175-5334 (online edition)

ZOOTAXA

2956

The tryphosine genera *Photosella* gen. nov. and *Tryphosella* Bonnier, 1893 (Crustacea: Amphipoda: Lysianassoidea: Lysianassidae: Tryphosinae) in Australian waters

J.K. LOWRY¹ & H.E. STODDART²

Crustacea Section, Australian Museum, 6 College Street, Sydney, New South Wales, 2010, Australia.

E-mail: ¹jim.lowry@austmus.gov.au; ²helen.stoddart@austmus.gov.au

Magnolia Press
Auckland, New Zealand

Accepted by G. Karaman: 19 May 2011; published: 8 Jul. 2011

J.K. LOWRY & H.E. STODDART

The tryphosine genera *Photosella* gen. nov. and *Tryphosella* Bonnier, 1893 (Crustacea: Amphipoda: Lysianassoidea: Lysianassidae: Tryphosinae) in Australian waters
(*Zootaxa* 2956)

76 pp.; 30 cm.

8 July 2011

ISBN 978-1-86977-755-5 (paperback)

ISBN 978-1-86977-756-2 (Online edition)

FIRST PUBLISHED IN 2011 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

<http://www.mapress.com/zootaxa/>

© 2011 Magnolia Press

All rights reserved.

No part of this publication may be reproduced, stored, transmitted or disseminated, in any form, or by any means, without prior written permission from the publisher, to whom all requests to reproduce copyright material should be directed in writing.

This authorization does not extend to any other kind of copying, by any means, in any form, and for any purpose other than private research use.

ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

Table of contents

Abstract	3
Introduction	4
Material and methods	4
Lysianassidae Dana, 1849	5
Tryphosinae Lowry & Stoddart, 1997	5
<i>Photosella</i> gen. nov.	5
Key to species of <i>Photosella</i>	6
<i>Photosella charlotteae</i> (Lowry & Stoddart, 2009)	6
<i>Photosella miersi</i> (Stebbing, 1888)	7
<i>Photosella mucronata</i> (Pirlot, 1936)	12
<i>Tryphosella</i> Bonnier, 1893	12
Key to Australasian species of <i>Tryphosella</i>	17
<i>Tryphosella bet</i> Lowry & Stoddart, 2009	17
<i>Tryphosella betka</i> sp. nov.	18
<i>Tryphosella bicheno</i> sp. nov.	21
<i>Tryphosella camela</i> (Stebbing, 1910)	25
<i>Tryphosella chinchilla</i> sp. nov.	30
<i>Tryphosella cooeae</i> sp. nov.	34
<i>Tryphosella fortescue</i> sp. nov.	38
<i>Tryphosella freycinet</i> sp. nov.	42
<i>Tryphosella martrudan</i> sp. nov.	46
<i>Tryphosella orana</i> J.L. Barnard, 1972	49
<i>Tryphosella rodondo</i> sp. nov.	50
<i>Tryphosella seasana</i> Lowry & Stoddart, 2009	54
<i>Tryphosella sorell</i> sp. nov.	55
<i>Tryphosella tathra</i> sp. nov.	59
<i>Tryphosella toowoomba</i> sp. nov.	63
<i>Tryphosella tuckanarra</i> sp. nov.	66
<i>Tryphosella wangaratta</i> sp. nov.	70
Acknowledgements	73
References	74
APPENDIX	76

Abstract

Within the lysianassid amphipod subfamily Tryphosinae the new genus *Photosella* is established with three included species: *P. charlotteae* (Lowry & Stoddart, 2009); *P. miersi* (Stebbing, 1888) and *P. mucronata* (Pirlot, 1936). The genus *Tryphosella* is rediagnosed and thirteen new Australian species are described: *T. betka* **sp. nov.**; *T. bicheno* **sp. nov.**; *T. chinchilla* **sp. nov.**; *T. cooeae* **sp. nov.**; *T. fortescue* **sp. nov.**; *T. freycinet* **sp. nov.**; *T. martrudan* **sp. nov.**; *T. rodondo* **sp. nov.**; *T. sorell* **sp. nov.**; *T. tathra* **sp. nov.**; *T. toowoomba* **sp. nov.**; *T. tuckanarra* **sp. nov.** and *T. wangaratta* **sp. nov.** *Tryphosella camela* and *T. orana* are redescribed. There are now 19 species of *Tryphosella* known from Australian waters. The 79 species currently attributed to *Tryphosella* are carefully assessed: 40 species are confirmed as definitely *Tryphosella*; 24 species are considered as possibly in *Tryphosella*, but cannot be confirmed or denied because of insufficient evidence; and 15 species are excluded from the genus.

Key words: Crustacea, Amphipoda, Lysianassidae, Tryphosinae, Australia, new species, taxonomy, *Photosella*, *Tryphosella*

Introduction

Several Australasian lysianassoid species have always been taxonomically problematic. Stebbing (1888) described *Hippomedon miersi* from Bass Strait. Since then it has been placed in *Tmetonyx* Stebbing, 1906, in the family Uristidae (by Stebbing 1906), in *Anonyx* Krøyer, 1838, also in the family Uristidae (by Della Valle 1893), in *Tryphosella* Bonnier, 1893, in the family Lysianassidae (by Barnard & Karaman 1991) and in *Galathella* Barnard & Karaman, 1987, in the family Uristidae (by Lowry & Stoddart 2003). Pirlet (1936) described *Tmetonyx mucronatus* from Waigeo Island in West Papua New Guinea. Barnard & Karaman (1991) moved this species to the genus *Tryphosella* in the Lysianassidae. Recently Lowry & Stoddart (2009) described *Tryphosella charlotteae* from the Great Barrier Reef. In this paper we reconsider these three taxa based on a new detailed assessment of generic level tryphosine characters and place them in the new genus *Photosella*.

Tryphosella is a world-wide genus of 40 confirmed species recorded from the intertidal down to nearly 4000 m depth. Some species in the genus are scavengers taken in large numbers in baited traps. Until recently there were only three species of *Tryphosella* recorded from Australia: *T. camela* (Stebbing, 1910) from central to southern New South Wales; *T. miersi* (Stebbing, 1888) from Bass Strait (transferred here to *Photosella*) and *T. orana* J.L. Barnard, 1972 from south-western Western Australia. Lowry & Stoddart (2009) described four scavenging species from the Great Barrier Reef: *T. bet* Lowry & Stoddart, 2009; *T. cameloides* Lowry & Stoddart, 2009; *T. flynnana* Lowry & Stoddart, 2009; and *T. seasana* Lowry & Stoddart, 2009. *Tryphosella charlotteae* Lowry & Stoddart, 2009 was also described but is transferred here to *Photosella*. In this paper we rediagnose *Tryphosella*, assess all 79 species currently assigned to the genus and describe 13 new Australian species: *T. betka* **sp. nov.**, *T. bicheno* **sp. nov.**, *T. chinchilla* **sp. nov.**, *T. cooe* **sp. nov.**, *T. fortescue* **sp. nov.**, *T. freycinet* **sp. nov.**, *T. martrudan* **sp. nov.**, *T. rodondo* **sp. nov.**, *T. sorell* **sp. nov.**, *T. tathra* **sp. nov.**, *T. toowoomba* **sp. nov.**, *T. tuckanarra* **sp. nov.** and *T. wangaratta* **sp. nov.**; and redescribe *T. camela* and *T. orana*. There are now 19 species of *Tryphosella* known from Australian waters.

Material and methods

The descriptions were generated from a DELTA database (Dallwitz 2005) to the tryphosine species of the world. The **bold** parts of the descriptions are diagnostic characters which distinguish each taxon in at least two respects from every other taxon.

Much of the material used in this study was collected by the Australian Museum SEAS project (Lowry & Smith 2003). Material is lodged in the Australian Museum, Sydney (AM); Museum Victoria, Melbourne (MV); the Queensland Museum, Brisbane (QM); the South Australian Museum, Adelaide (SAM) and the Western Australian Museum, Perth (WAM). Standard abbreviations on the plates are: A, antenna; C, coxa; E, epistome; EP, epimeron; G, gnathopod; H, head; MD, mandible; MX, maxilla; MP, maxilliped; P, pereopod; T, telson; U, uropod.

Measurements

Coxa 1. Length is measured from the anteroproximal point of attachment to the point equivalent to the greatest distal extent on a line parallel to the anterior margin. Breadth is measured from the anteroproximal corner to the posteroproximal corner along the line of articulation with the pereon. For our descriptions we have made artificial divisions between "small" (length 1 to 1.4 x breadth), "medium" (length 1.5 to 1.8 x breadth) and "large" (length 1.9 or more x breadth). In previous publications (Lowry & Stoddart 1997, 2009) we have tried to combine the length/breadth ratio of coxa 1 with an assessment of the length of coxa 1 compared to the length of coxa 2. This comparison is often noticeable in whole-animal illustrations but is not consistent with the actual ratio of coxa 1 length to breadth.

Gnathopod 1 ischium. Length is measured from the condyle between the basis and the ischium to the condyle between the ischium and the merus. This measurement is about the same as from the midpoint of the basis distal margin to the midpoint of the ischium distal margin, so if the two condyles are not obvious the length is measured between these two points. This measurement avoids the variation that can occur in the apparent length of the ischium, if measured along the posterior margin, that occurs when the gnathopod is flexed or extended. Breadth is measured about half way along, and perpendicular to, the posterior margin; this is usually the narrowest part of the

ischium and avoids the commonly-occurring bulge in the distal part of the anterior margin which occurs when the gnathopod is flexed. Although there is a continuum in these measurements we have made an artificial division where "short" = length less than 2 x breadth and "long" = length between 2 and 4 x breadth.

For previous papers (Lowry & Stoddart 1994, 1995, 1997, 2009) we measured the length of the ischium along the posterior margin. Under our revised scheme, the description of the ischium for *T. bet*, *T. flynnana* and *P. charlotteae* would change from "long" to "short"; other described species would retain their classification, but the actual cited ratio would be slightly different.

Pereopod 5 basis. Length is measured from the apex of the anteroproximal lobe to the midpoint of the articulation between the basis and the ischium; breadth is measured from the anterior to the posterior margin at the broadest part of the article.

Uropod 3 outer ramus article 2. Short = less than 0.2 x length of article 1; long = up to half length of article 1.

Telson. Moderately cleft = 30 to 64% cleft; deeply cleft = more than 64% cleft.

Lysianassidae Dana, 1849

Tryphosinae Lowry & Stoddart, 1997

Photosella gen. nov.

Diagnostic description. Body not expanded to form a lateral bulge, without dorsal carina.

Antenna 1 accessory flagellum not forming cap, terminal article not offset. *Antenna 2* peduncular article 3 short; peduncular article 4 or articles 4 and 5 enlarged in male. **Mandible molar with asymmetrically reduced column, proximally setose, distally triturating**; palp attached distally. *Maxilla 1* setal-tooth 7, left and right symmetrical, cuspidate along most of straight inner margin.

Gnathopod 1 subchelate; coxa large, nearly twice as long as broad, subrectangular, distally subovate; carpus short; propodus margins subparallel. *Pereopod 4* with a well-developed posteroventral lobe. **Pereopod 5 coxa with or without distinct lateral ridge; basis with photophore**, posterior margin without mid-central spine, posteroventral lobe or spine.

Urosomite 1 not projecting over urosomite 2. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange; inner and outer rami well developed; plumose setae present on rami in male and female. **Telson deeply cleft (more than 64%).**

Type species. *Tryphosella charlotteae* Lowry & Stoddart, 2009.

Etymology. The name *Photosella* refers to the photophore on pereopod 5 basis and means 'little light'.

Included species. *Photosella* includes 3 species: *P. charlotteae* (Lowry & Stoddart, 2009); *P. miersi* (Stebbing, 1888); *P. mucronata* (Pirlot, 1936).

Remarks. The slightly shortened first coxa with a subovate distal margin and the basis of pereopod 5 with a well-developed photophore are both autapomorphies for this genus. *Photosella* also differs from other tryphosine genera in having strongly developed robust setae along the inner margin of the maxilliped outer plate and densely plumose setae on both rami of the third uropods in both males and females.

Based on other characters such as a distally attached mandibular palp, an asymmetrical, triturating molar and a deeply cleft telson, *Photosella* is most similar to tryphosine genera such as *Cedrosella* Barnard & Karaman, 1987, *Coximodon* Barnard & Karaman, 1991 and *Orenoqueia* Bellan-Santini, 1997. *Photosella* differs from these genera in having a large first coxa, which is only slightly shorter than coxa 2 and is distally subovate.

Species of *Photosella* apparently have a true photophore on the basis of pereopod 5. Although the photophore has never been observed emitting light it has all of the external morphological features of a photophore (Eldon Ball, pers. comm.)

Distribution. The genus is currently known from Indonesia (Pirlot 1936) and Australia (Stebbing 1888; Lowry & Stoddart 2009 and current study).

Key to species of *Photosella*

- | | | |
|----|--|-----------------------|
| 1. | Pereopods 4 and 5 coxa without ridging | <i>P. miersi</i> |
| - | Pereopods 4 and/or 5 coxa with ridging | 2 |
| 2. | Pereopods 4 and 5 coxa with ridging | <i>P. charlotteae</i> |
| - | Pereopod 5 coxa with ridging | <i>P. mucronata</i> |

Photosella charlotteae (Lowry & Stoddart, 2009)

(Fig. 1)

Tryphosella charlotteae Lowry & Stoddart, 2009: 587, figs 17, 18.

Type locality. 100 metres north-east of sand spit, One Tree Island, Queensland, Australia, 23°30'S 152°05'E, 1 m depth.

Material examined. *Victoria*: 1 specimen, MV J3610, Crib Point, Western Port, 38°21'S 145°14'E, 12 m, coarse sand, Smith-McIntyre grab, 29 September 1964, Marine Studies Group, Fisheries and Wildlife Department, Ministry for Conservation, Victoria, CPBS stn C4; 1 specimen, MV J3614, Crib Point, Western Port, 38°21.63'S 145°15.08'E, 9 m, sand, Smith-McIntyre grab, 23 February 1965, Marine Studies Group, Fisheries and Wildlife Department, Ministry for Conservation, Victoria, CPBS stn 25S; 1 specimen, MV J3617, Crib Point, Western Port, 38°21.33'S 145°13.64'E, 15 m, fine sand and mud, Smith-McIntyre grab, 8 April 1965, Marine Studies Group, Fisheries and Wildlife Department, Ministry for Conservation, CPBS stn 31S; 4 specimens, MV J3299, Port Phillip Bay, 38°00.0'S 144°46.3'E, 11 m, sand, Smith-McIntyre grab, 10 June 1971, stn PPBES 913; 1 specimen, MV J3298, Port Phillip Bay, 38°02.3'S 144°44.7'E, 13 m, sand, Smith-McIntyre grab, 10 June 1971, stn PPBES 922; 1 male, MV J62293, 66 km south of Rodondo Island, central Bass Strait, 39°48.6'S 146°18.8'E, 82 m, sand, silt and mud, epibenthic sled, 13 November 1981, R. Wilson, RV *Tangaroa*, stn BSS-158S. *Tasmania*: 1 female, 14.5 mm, MV J11262, 25 km north-east of Deal Island, eastern Bass Strait, 39°14.8'S 147°31.5'E, 57 m, medium sand, Smith-McIntyre grab, 18 November 1981, RV *Tangaroa*, stn BSS 174G. *South Australia*: 1 specimen, AM P.69118, 5 km north-west of Port Davis Creek, Port Pirie, Spencer Gulf, 33°16'S 137°51'E, corer, *Posidonia sinuosa* bed, stn 801-C4/7; 1 female, SAM C6946, 200 m offshore, north point of Marum Island, Sir Joseph Banks Group, approx. 34°30'S 136°15'E, 6 m, on sponge and under rocky reef, 11 January 1984, W. Zeidler; 1 male, MV J62308 north side of West Island, Encounter Bay, 35°37'S 138°36'E, 4 m, sand patch in *Heterozostera* meadow, 21 March 1985, G.C.B. Poore & H.M. Lew Ton, stn MV SA-48.

Diagnostic description. *Head* lateral cephalic lobe subtriangular, apically rounded; eyes red (fading in alcohol), large, subtriangular with ventral concave lens. *Antenna 1* flagellum with strong 2-field calynophore, robust setae absent from proximal articles; calceoli present. *Antenna 2* peduncular articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* epistome less produced than upper lip, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally tritulating. *Maxilla 1* outer plate setal-tooth 7, left and right symmetrical, cuspidate along most of straight inner margin; palp distal margin with apical robust setae. *Maxilliped* outer plate with 2 short apical robust setae.

Gnathopod 1 subchelate; coxa large (length 1.9 x breadth), subrectangular, distally subovate; basis moderately setose along anterior margin; ischium short (length 1.5 x breadth); carpus long (length 2.1 x breadth), subequal in length to propodus, without posterior lobe; propodus margins subparallel, palm moderately acute. *Gnathopod 2* propodus palm moderately obtuse. **Pereopod 4 coxa with distinct lateral ridge. Pereopod 5 coxa with distinct lateral ridge;** basis about as long as broad, with photophore.

Epimeron 3 posterior margin smooth, posteroventral corner broadly rounded. *Uropod 3* outer ramus article 2 short, with plumose setae on both rami. *Telson* deeply cleft, with dorsal robust setae, with 1 or 2 apical robust setae on each lobe.

Male (sexually dimorphic characters). *Antennae 1 and 2* calceoli present. *Antenna 2* peduncular article 4 slightly enlarged.

Remarks. According to Lowry & Stoddart (2009) *P. charlotteae* is most similar to *P. mucronata* (Pirlot, 1936). Both species have a well developed photophore on the basis of pereopod 5, but only *T. charlotteae* has a strong lateral ridge on the pereopod 4 coxa. Lowry & Stoddart (2009) recorded *T. charlotteae* from the Great Barrier Reef as far south as Moreton Bay. In this paper we extend the range south to Bass Strait.

There is a great deal of variation in the honeycomb appearance of the cuticle in this species. In the material reported by Lowry & Stoddart (2009) there was almost none present; the specimen illustrated in Figure 1 shows a very strong form. We cannot see any pattern to this variation and its loss might be an artefact of preservation.

Distribution. Eastern and southern Australia; 4–15 m and 57–82 m depth.

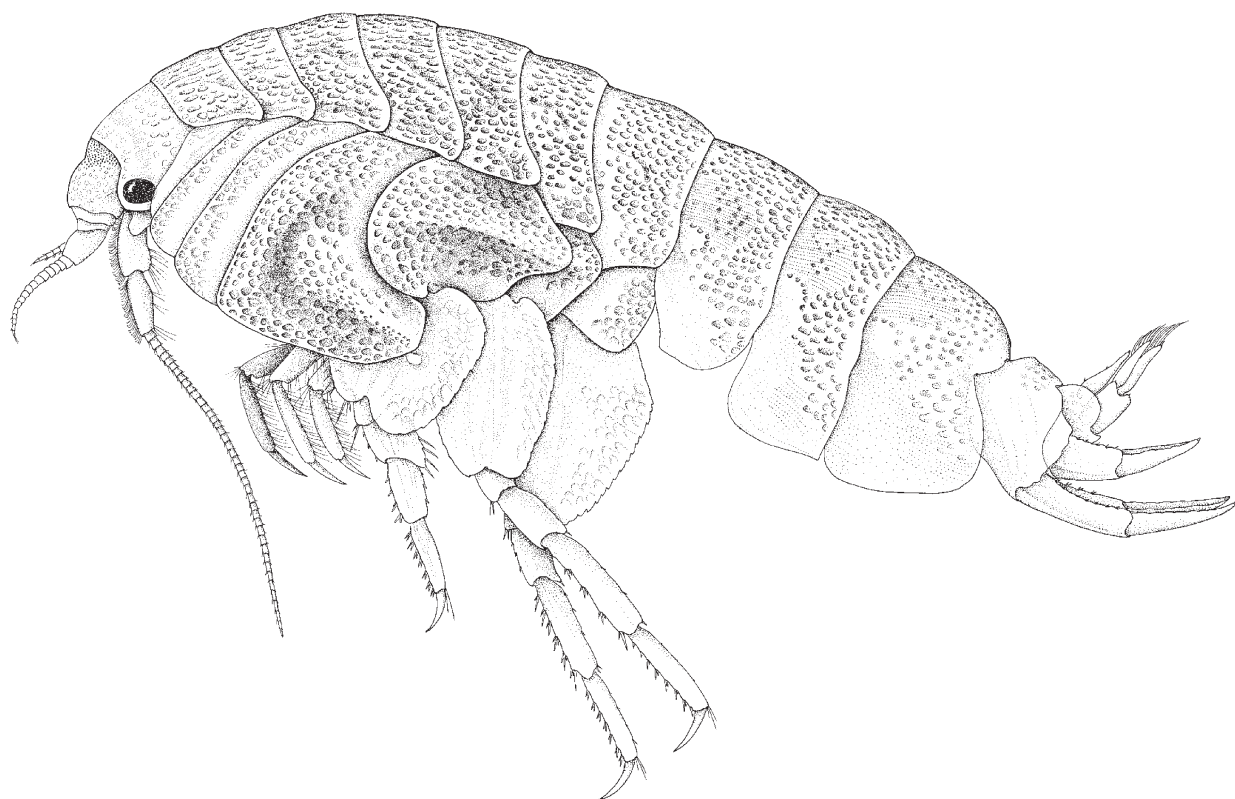


FIGURE 1. *Photosella charlotteae* (Lowry & Stoddart, 2009). Female, 14.5 mm, MV J11262, Bass Strait.

***Photosella miersi* (Stebbing, 1888)**

(Figs 2–4)

Hippomedon miersi Stebbing, 1888: 631, pl. 10.

Anonyx Miersii. —Della Valle, 1893: 813.

Tmetonyx miersi. —Stebbing, 1906: 74 (key), 75. —Sheard, 1937: 19. —J.L. Barnard, 1958: 100. —J.L. Barnard, 1962: 29, 30 (key). —Thurston & Allen, 1969: 369.

Tryphosella miersi. —Barnard & Karaman, 1991: 537.

Galathella miersi. —Lowry & Stoddart, 2003: 280.

Type locality. East of Moncoeur Island, Bass Strait, Australia, 39°10'30"S 146°37'00"E, 69.5 m depth.

Material examined. *New South Wales*: 43 specimens, AM P.58468, north-east of Coffs Harbour, 30°14'38"S 153°27'41"E, 100 m, baited trap, 12–13 August 1993, P.B. Berents, R.T. Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-884; 3 specimens, AM P.52619, north-east of Coffs Harbour, 30°15'45"S 153°21'59"E, 100 m, baited trap, 12–13 August 1993, P.B. Berents, R.T. Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-886; 11 specimens, AM P.52651, same data, stn NSW-887; 17 specimens, AM P.55969, north-east of Coffs Harbour, 30°15'56"S 153°21'54"E, 100 m, baited trap, 11–12 August 1993, P.B. Berents, R.T. Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-870; 1 specimen, AM P.57620 and 14 specimens, AM P.57621, same data, stn NSW-872; 6 specimens, AM P.48195, north-east of Coffs Harbour, 30°15'56"S 153°21'54"E, 100 m, baited trap, 8–9 September 1994, J.K. Lowry & K. Dempsey, MV *Carrie Anne*, stn NSW-984; 20 specimens, AM P.48184, same data, stn NSW-985; 3 specimens, AM P.48428, same data, 9–10 September 1994, stn NSW-1006; 1 female, AM P.70483, south-east of

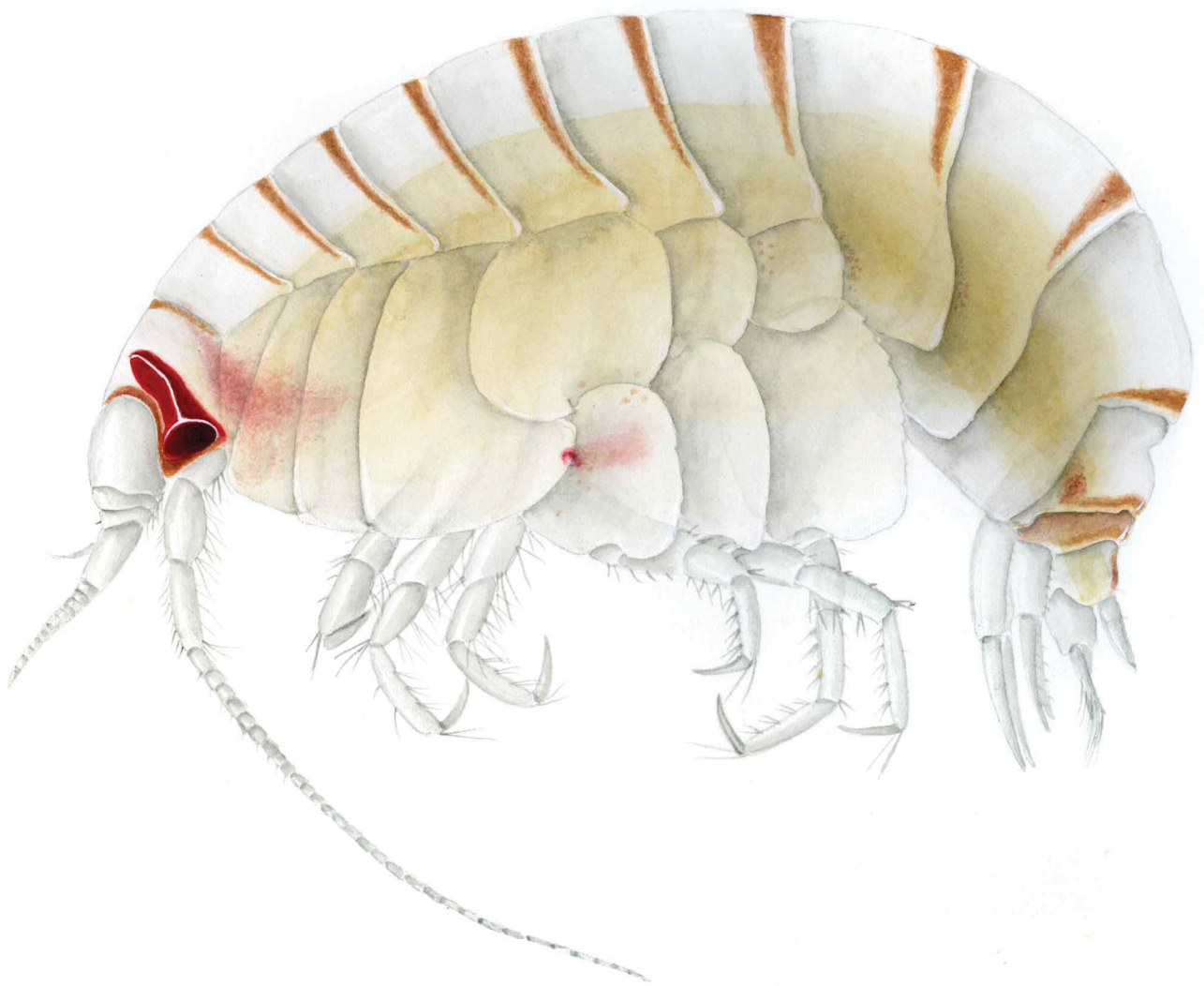


FIGURE 2. *Photosella miersi* (Stebbing, 1888). Hannants Bight, north side of Cape Sorell, Tasmania.

Port Stephens, 32°52'S 152°32'E, 145 m, dredge, 6 December 1978, FRV *Kapala*, stn K78-26-07; 1 male, 13.2 mm, AM P.70484, east of Long Reef Point, 33°43'S 151°46'E to 33°44'S 151°46'E, 174 m, epibenthic sled, 19 December 1985, 2230–2300 hrs, J.K. Lowry & R.T. Springthorpe, FRV *Kapala*, stn K85-21-08; 1 male, AM P.1825123 km east of Cape Banks, 33°58'24"S 151°29'E, 150 m, orange-peel grab, 18 June 1962, CSIRO Fisheries, HMAS *Gascoyne*, stn G2/62/56. *Victoria*: 1 specimen, MV J62295, 31 km south-south-west of Cape Otway, western Bass Strait, 39°08'S 143°24'E, 77 m, medium sand, Smith-McIntyre grab, 8 October 1980, G.C.B. Poore, HMAS *Kimbla*, stn BSS-56G; 1 specimen, MV J62294, 32 km south-south-west of Cape Otway, western Bass Strait, 39°09'S 143°26'E, 85 m, coarse carbonate sand, dredge, 8 October 1980, G.C.B. Poore, HMAS *Kimbla*, stn BSS-55D; 1 specimen, MV J62299, 51 km south-south-west of Cape Otway, western Bass Strait, 39°18'S 143°03'E, 113 m, coarse carbonate sand, Smith-McIntyre grab, 10 October 1980, G.C.B. Poore, HMAS *Kimbla*, stn BSS-69G; 1 specimen, MV J62296, 26 km south-west of Cape Otway, western Bass Strait, 39°01.0'S 143°22.1'E, 84 m, medium sand, dredge, 31 January 1981, M. Gomon *et al.*, FRV *Hai Kung*, stn BSS-120D; 3 specimens, MV J62297, 38 km south-west of Cape Paterson, central Bass Strait, 38°56.4'S 145°16.6'E, 70 m, fine sand, epibenthic sled, 12 November 1981, R. Wilson, RV *Tangaroa*, stn BSS-155S; 1 specimen, MV J62298, 44 km north-north-east of Cape Wickham, King Island, central Bass Strait, 39°16.0'S 144°05.4'E, 82 m, sandy shell, rock dredge, 23 November 1981, R. Wilson, RV *Tangaroa*, stn BSS-204RD. *Tasmania*: 1 male, AM P.70485, 1 female, AM P.70486 and 4 specimens, AM P.70487, about 80 m outside Hannants Bight, north side of Cape Sorell, 42°11.5'S 145°11'E, 18 m, baited trap on sand and detritus, 26–27 April 1991, J.K. Lowry & S.J. Keable, stn TAS-277; 1 specimen, AM

P.70488, about 400 m outside Hannants Bight on a line toward large bluff of Ocean Beach, north side of Cape Sorell, 42°11.4'S 145°11.1'E, 30 m, baited trap on sand, 26–27 April 1991, J.K. Lowry & S.J. Keable, stn TAS-279; 5 specimens, AM P.70489, about 50 m offshore and just east of Hannants Bight on a line toward large bluff of Ocean Beach, north side of Cape Sorell, 42°11.5'S 145°11.4'E, 18 m, baited trap on sand, 26–27 April 1991, J.K. Lowry & S.J. Keable, stn TAS-281; 6 specimens, AM P.45776, east of Fortescue Bay, north of Hippolyte Rocks, 43°06'42"S 148°03'27"E, 100 m, baited trap, 16–17 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-353; 68 specimens, AM P.51085, same data, stn TAS-354; 6 specimens, AM P.58244 and 1 specimen, AM P.70490, same data, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-389; 38 specimens, AM P.51090, same data, stn TAS-390; 40 specimens, AM P.51191, same data, stn TAS-391; 38 specimens, AM P.51332, same data, 9–10 April 1994, stn TAS-408; 20 specimens, AM P.51318, same data, stn TAS-409; 1 specimen, AM P.45747, mouth of Fortescue Bay, 43°07'46"S 145°59'28"E, 100 m, baited trap, 16–17 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-350; 2 specimens, AM P.51314, same data, 9–10 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-406. *South Australia*: 1 female, AM P.70491, Marino, Gulf St Vincent, approx. 35°03'S 138°31'E, 1910, W.H. Baker. *Western Australia*: 1 specimen, P.18195, east of Albany, 34°32'S 121°31'E, orange-peel grab, 9 July 1962, CSIRO Fisheries, HMAS *Gascoyne*, stn G2/62/109; 1 specimen, AM P.70492, north-west of Port Hedland, North West Shelf, 19°05.3'S 118°54.0'E to 19°05.1'S 118°54.2'E, 82–83 m, epibenthic sled, 15 February 1983, FRV *Soela*, CSIRO stn NWS 01.B4.S; 1 female, AM P.70493, north-west of Port Hedland, North West Shelf, 19°05.4'S 118°53.9'E to 19°05.3'S 118°54.0'E, 80 m, beam trawl, 30 October 1983, FRV *Soela*, CSIRO stn NWS 05.B4.BT; 3 specimens, AM P.70494, north-west of Port Hedland, North West Shelf, 19°04.8'S 118°50.7'E to 19°05.2'S 118°50.4'E, 81 m, epibenthic sled, 30 October 1983, FRV *Soela*, CSIRO stn NWS 05.B5.S; 4 specimens, AM P.70495, north-west of Port Hedland, North West Shelf, 19°04.1'S 118°47.8'E to 19°04.7'S 118°47.2'E, 82 m, epibenthic sled, 30 October 1983, FRV *Soela*, CSIRO stn NWS 05.B6.S; 2 specimens, AM P.70496, north-west of Port Hedland, North West Shelf, 19°02.0'S 118°47.2'E to 19°01.7'S 118°47.1'E, 82 m, epibenthic sled, 7 December 1982, FRV *Soela*, CSIRO stn NWS 06.B6.S

Diagnostic description. *Head* lateral cephalic lobe subtriangular, apically subacute; eyes (fading in alcohol), large, subtriangular with ventral concave lens. *Antenna 1* flagellum with strong 2-field calynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* epistome less produced than upper lip, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating. *Maxilla 1* setal-tooth 7, left and right symmetrical, cuspidate along most of straight inner margin; palp distal margin with apical robust setae. *Maxilliped* outer plate with 2 short apical robust setae.

Gnathopod 1 subchelate; coxa large (length 1.8 x breadth), subrectangular, distally subovate; basis moderately setose along anterior margin; ischium short (length 1.4 x breadth); carpus long (length 2 x breadth), shorter than propodus, without posterior lobe; propodus margins subparallel, palm moderately acute. *Gnathopod 2* propodus palm moderately obtuse. **Pereopod 4 coxa without distinct lateral ridge. Pereopod 5 coxa without distinct lateral ridge;** basis about as long as broad, with photophore.

Epimeron 3 posterior margin smooth, posteroventral corner broadly rounded. *Urosomite 1* with anterodorsal notch and slightly rounded boss. *Uropod 3* outer ramus article 2 short, with plumose setae on both rami. *Telson* deeply cleft, with dorsal robust setae, with 1 or 2 apical robust setae on each lobe.

Male (sexually dimorphic characters). *Antennae 1 and 2* calceoli present. *Antenna 2* peduncular article 4 enlarged.

Remarks. Although Stebbing (1888) did not record or illustrate a photophore on the basis of pereopod 5 of his specimen we feel sure the present material is the same species. It is possible that Stebbing overlooked the structure, as it can be very difficult to discern in material that is de-calcified by preservatives. *Photosella miersi* is the only species in the genus without ridging on the coxa of pereopods 4 or 5.

Distribution. South-eastern and southern Australia to Port Hedland in north-western Australia; 18–174 m depth.

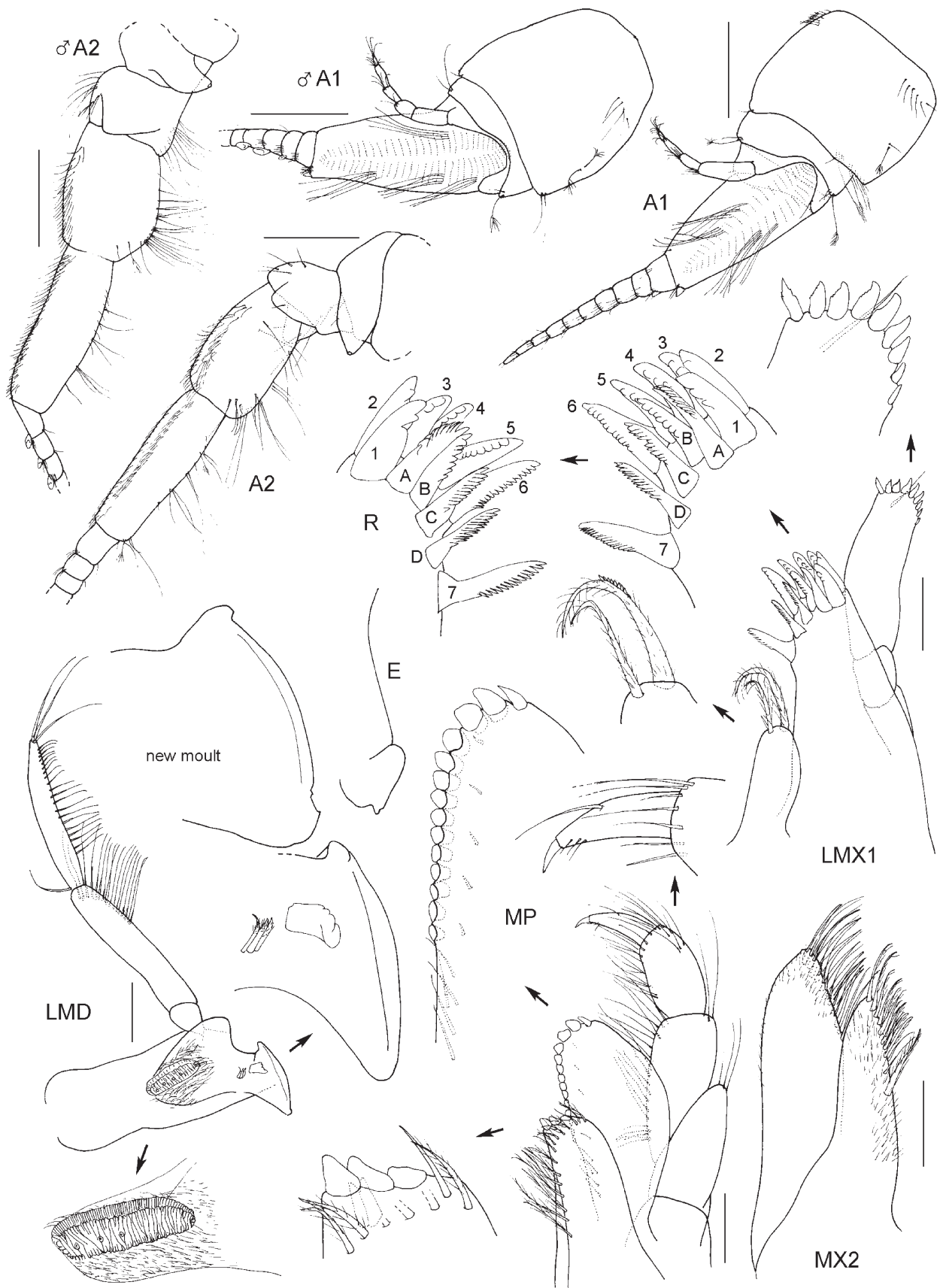


FIGURE 3. *Photosella miersi* (Stebbing, 1888). Female, 13.0 mm, AM P.70483; male, 13.2 mm, AM P.71834; New South Wales. Scales for A1, A2 represent 0.5 mm; remainder represent 0.2 mm.

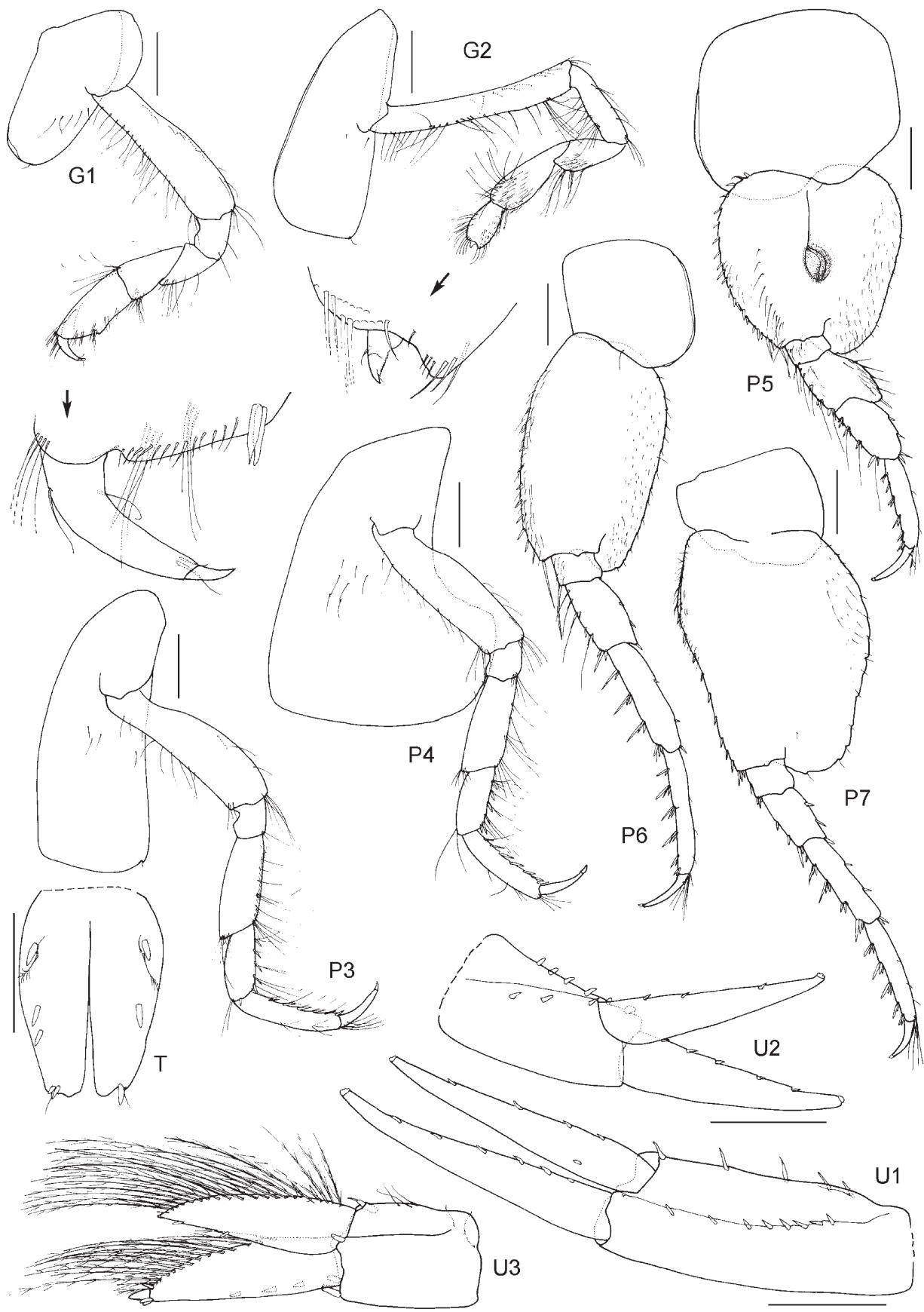


FIGURE 4. *Photosella miersi* (Stebbing, 1888). Female, 13.0 mm, AM P. 70483, New South Wales. Scales represent 0.5 mm.

Photosella mucronata (Pirlot, 1936)

(Figs 5, 6)

Tmetonyx mucronatus Pirlot, 1936: 275, fig. 108. —J.L. Barnard, 1958: 100. —J.L. Barnard, 1962: 30 (key).

Tryphosella mucronata. —Barnard & Karaman, 1991: 537.

Type locality. North-west of Waigeo Island, West New Guinea, Indonesia, 0°3'8"N 130°24'E, 141 m depth.

Material examined. All stations are north-west of Port Hedland, North West Shelf, Western Australia and were collected by the CSIRO on FRV *Soela*. 1 female and 1 male, AM P.71828, 19°56.8'S 117°53.4'E to 19°56.4'S 117°53.7'E, 42 m, beam trawl, 22 April 1983, stn NWS 02.B2.BT; 6 specimens, AM P.71829, 19°56.9'S 117°53.7'E to 19°56.4'S 117°53.8'E, 42–43 m, epibenthic sled, 22 April 1983, stn NWS 02.B2.S; 1 specimen, AM P.71830, 19°05.4'S 118°53.3'E to 19°05.428.2'S 118°54.1'E, 82 m, epibenthic sled, 27 April 1983, stn NWS 02.B4.S; 1 ovigerous female, AM P.71831, 19°56.4'S 117°53.9'E to 19°56.8'S 117°53.6'E, 44 m, epibenthic sled, 25 June 1983, stn NWS 03.B2.S; 3 specimens, AM P.71832, 19°56.8'S 117°53.5'E to 19°56.4'S 117°53.9'E, 44 m, beam trawl, 25 June 1983, stn NWS 03.B2.BT; 1 male, AM P.71833, 19°56.6'S 117°54.1'E to 19°56.3'S 117°53.9'E, 44 m, beam trawl, 26 August 1983, stn NWS 04.B2.BT; 1 male, AM P.71834, 19°56.7'S 117°53.6'E to 19°56.4'S 117°54.0'E, 41 m, epibenthic sled, 26 October 1983, stn NWS 05.B2.S; 1 male, AM P.71835, 19°29.7'S 118°52.0'E to 19°29.4'S 118°52.5'E, 39 m, epibenthic sled, 25 October 1983, stn NWS 05.D3.S; 1 female, AM P.71836, 19°29.6'S 118°51.7'E to 19°29.9'S 118°51.0'E, 40–41 m, epibenthic sled, 25 October 1983, stn NWS 05.D7.S; 1 male, AM P.71837, 19°04.1'S 118°47.8'E to 19°04.7'S 118°47.2'E, 82 m, beam trawl, 23 October 1983, stn NWS 05.B10.BT.

Diagnostic description. *Head* lateral cephalic lobe subtriangular, apically rounded; eyes (fading in alcohol), large, subtriangular with ventral concave lens. *Antenna 1* flagellum with strong 2-field calynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* epistome less produced than upper lip, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating. *Maxilla 1* setal-tooth 7, left and right symmetrical, cuspidate along most of straight inner margin; palp distal margin with apical robust setae. *Maxilliped* outer plate with 2 short apical robust setae.

Gnathopod 1 subchelate; coxa large (length 1.9 x breadth), subrectangular, distally subovate; basis moderately setose along anterior margin; ischium short (length 1.6 x breadth); carpus long (length 2 x breadth), shorter than propodus, without posterior lobe; propodus margins subparallel, palm moderately acute. *Gnathopod 2* propodus palm moderately obtuse. ***Pereopod 4* coxa without distinct lateral ridge. *Pereopod 5* coxa with distinct lateral ridge;** basis about as long as broad, with photophore.

Epimeron 3 posterior margin smooth, posteroventral corner broadly rounded. *Uropod 3* outer ramus article 2 short, with plumose setae on both rami. *Telson* deeply cleft, with dorsal robust setae, with 2 to 3 apical robust setae on each lobe.

Male (sexually dimorphic characters). *Antennae 1 and 2* calceoli present. *Antenna 2* peduncular articles 4 and 5 enlarged.

Remarks. When Pirlot first described this species he recognised its similarity to the species now known as *Photosella miersi* but noted the lack of a ridge on coxa 5 of Stebbing's species. *Photosella mucronata* differs from *P. miersi* in having a ridge on the coxa of pereopod 5. In Australia it is currently known only from the North West Shelf of Western Australia.

Distribution. Eastern Indonesia and north-western Australia, 39–141 m depth.

Tryphosella Bonnier, 1893

Pseudotryphosa Sars, 1891: 83.

Tryphosella Bonnier, 1893: 170. —J.L. Barnard, 1969: 365. —Thurston, 1974: 16. —Lincoln, 1979: 82. —Ruffo, 1985: 280.

—Oleröd, 1987: 155. —Diviacco & Ruffo, 1989: 559. —Barnard & Karaman, 1991: 536. —Lowry & Stoddart, 1995: 131. —Kilgallen *et al.*, 2006: 1067.

Tryphosa. —Sars, 1891: 75 (in part). —Stebbing, 1906: 68 (in part).

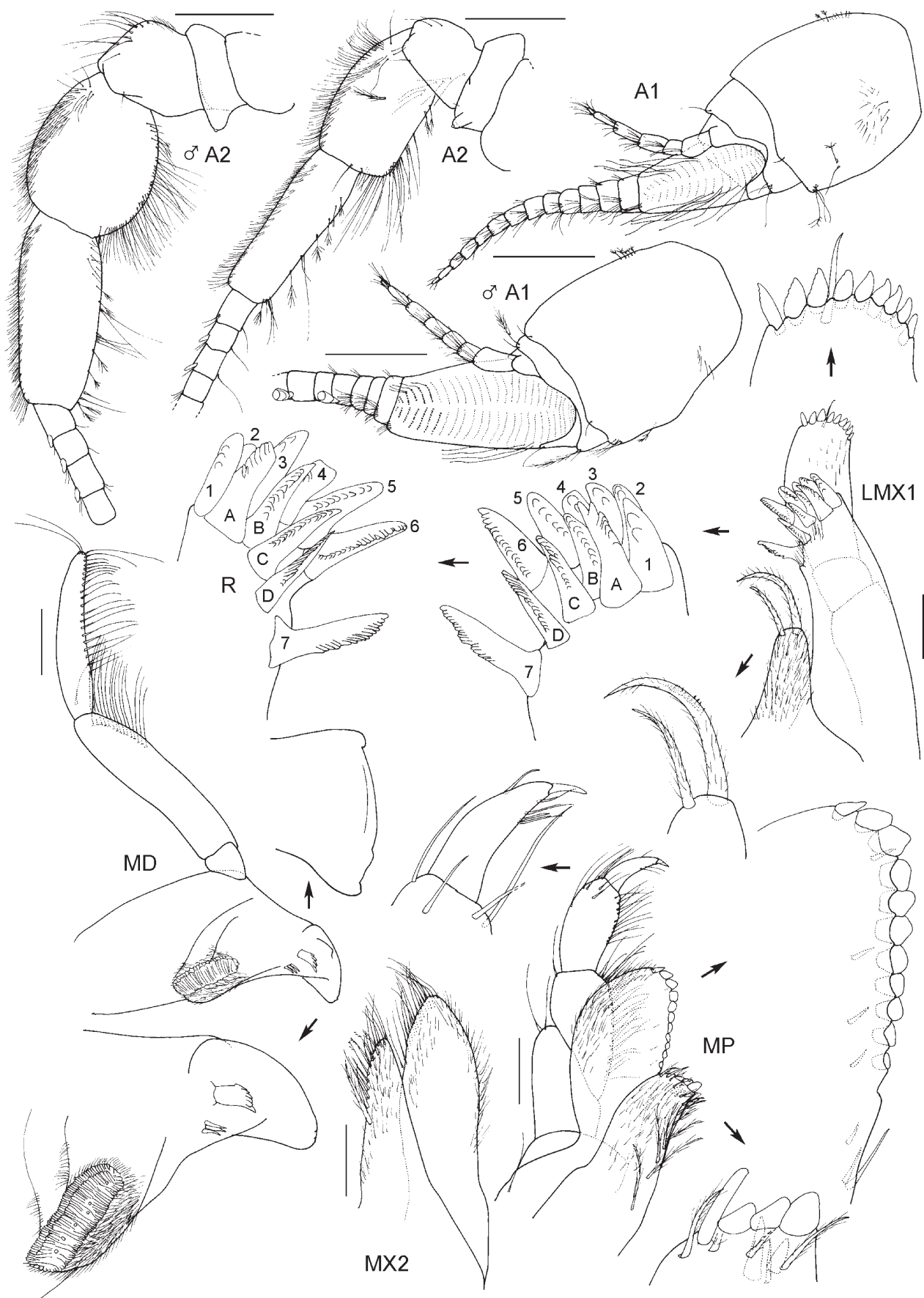


FIGURE 5. *Photosella mucronata* (Pirlot, 1936). Female, 14.2 mm, AM P.71831; male, 15.2 mm, AM P.71834; North West Shelf. Scales for A1, A2 represent 0.5 mm; remainder represent 0.2 mm.

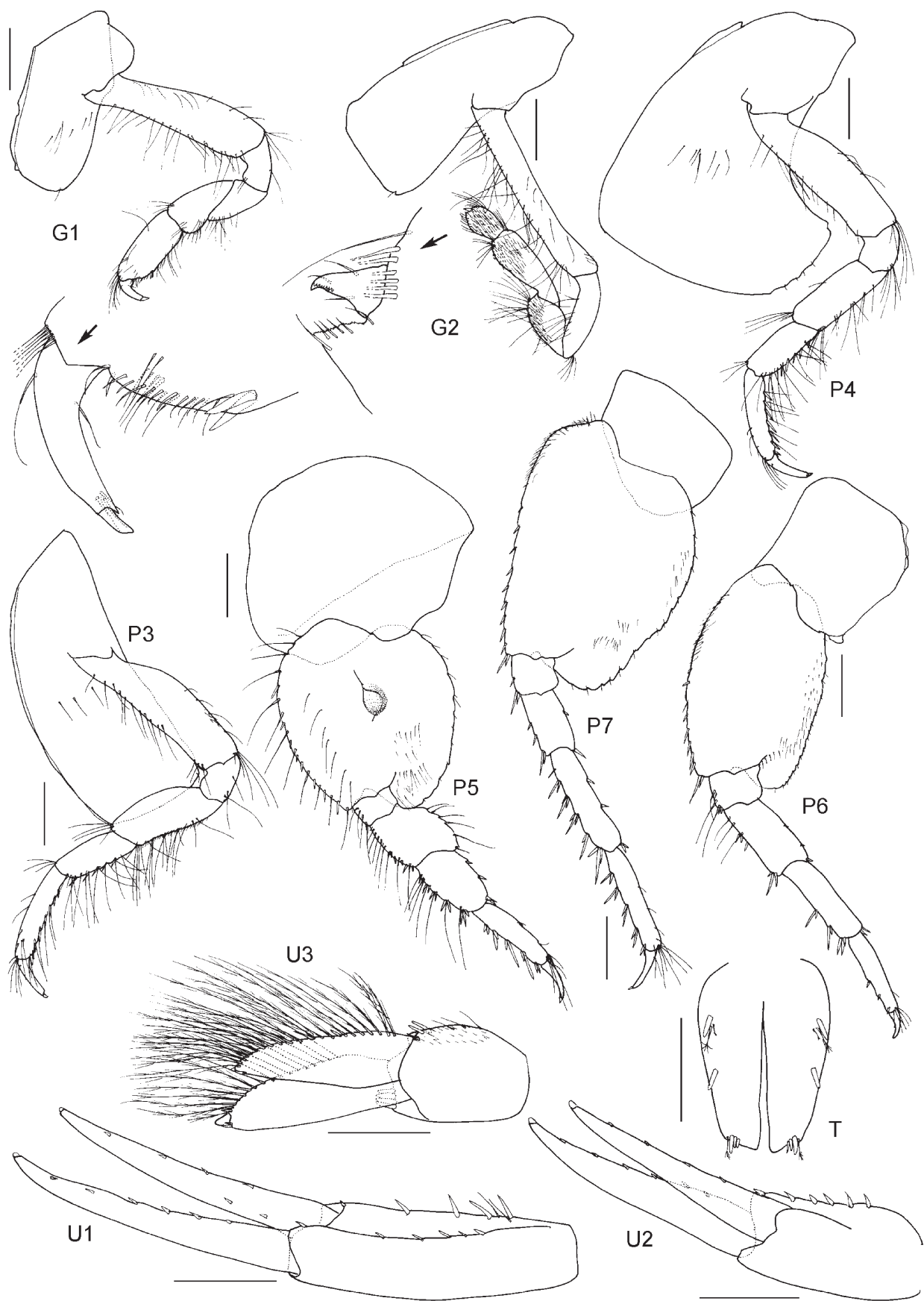


FIGURE 6. *Photosella mucronata* (Pirlot, 1936). Female, 14.2 mm, AM P.71831, North West Shelf. Scales represent 0.5 mm.

Diagnostic description. *Body* not expanded to form a lateral bulge, without dorsal carina. *Antenna 1* accessory flagellum not forming cap, terminal article not offset. *Antenna 2* peduncular article 3 short; articles 4 and/or 5 sometimes enlarged in male. **Mandible molar with asymmetrically reduced column, proximally setose, distally triturating**; palp attached about midway. **Maxilla 1 setal-tooth 7, left and right asymmetrical** (rarely symmetrical), left cuspidate along most of curved inner margin, right cuspidate along most of sinusoidal inner margin.

Gnathopod 1 subchelate (occasionally simple in male); **coxa large, slightly or significantly shorter than coxa 2, tapering distally or subquadrate**; **carpus long (length 2 or more x breadth)**, (occasionally short); propodus margins subparallel (except when gnathopod 1 simple). *Pereopod 4* with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge; basis without photophore, posterior margin without mid-central spine, posteroventral lobe or posteroventral spine.

Urosomite 1 not projecting over urosomite 2. *Uropod 2* inner ramus without constriction (rarely with). *Uropod 3* peduncle without dorsolateral flange; plumose setae on rami in male (occasionally also in female). **Telson deeply cleft (more than 64%)**.

Type species. *Tryphosella sarsi* Bonnier, 1893, selected by J.L. Barnard, 1969.

Confirmed species. *Tryphosella* includes 40 species: *T. abyssalis* (Stephensen, 1925); *T. ama* Lowry & Stoddart, 1994; *T. angulata* (Sars, 1895); *T. apalachicola* Lowry & Stoddart, 1997; *T. astrolabensis* Lowry & Stoddart, 1995; *T. bet* Lowry & Stoddart, 2009; *T. betka* **sp. nov.**; *T. bicheno* **sp. nov.**; *T. biloba* (Stephensen, 1925); *T. californica* (Hurley, 1963); *T. camela* (Stebbing, 1910); *T. cameloides* Lowry & Stoddart, 2009; *T. chinchilla* **sp. nov.**; *T. cooe* **sp. nov.**; *T. flynnana* Lowry & Stoddart, 2009; *T. fortescue* **sp. nov.**; *T. freycinet* **sp. nov.**; *T. horingi* (Boeck, 1871); *T. insignis* (Bonnier, 1896); *T. longidactyla* Ruffo, 1985; *T. longiseta* Ren in Ren & Huang, 1991; *T. lowryi* Kilgallen, Myers & McGrath, 2006; *T. martrudan* **sp. nov.**; *T. metacaecula* J.L. Barnard, 1967; *T. minima* (Chevreux, 1911); *T. moana* Kilgallen, 2009; *T. orana* J.L. Barnard, 1972; *T. oupi* Lowry & Stoddart, 1994; *T. quadrata* (J.L. Barnard, 1962); *T. rodondo* **sp. nov.**; *T. sarsi* Bonnier, 1893; *T. seasana* Lowry & Stoddart, 2009; *T. serans* Lowry & Stoddart, 1983; *T. sorell* **sp. nov.**; *T. tathra* **sp. nov.**; *T. toowoomba* **sp. nov.**; *T. tuckanarra* **sp. nov.**; *T. umbonatus* (Sars, 1883); *T. wangaratta* **sp. nov.**; *T. wongada* Lowry & Stoddart, 1995.

Possible species. The following 24 taxa are currently placed in *Tryphosella*. For each taxon there is insufficient information about the gnathopod 1 coxa and/or the mouthparts to confirm or reject this placement. Although for many of them it is not possible to decide if they are tryphosines or uristids (because the mouthparts have not been described), they are probably mostly tryphosines. *T. analogica* (K.H. Barnard, 1932); *T. barentsi* (Gurjanova, 1929); *T. bispinosa* (Schellenberg, 1931); *T. caecoides* (J.L. Barnard, 1962); *T. compressa* (Sars, 1895); *T. coxalis* (J.L. Barnard, 1962); *T. groenlandica* (Schellenberg, 1935); *T. index* (J.L. Barnard, 1966); *T. insignioides* (Stephensen, 1925); *T. longichela* (Stephensen, 1925); *T. macropareia* (Schellenberg, 1926); *T. marri* Thurston, 1974; *T. nanoides* (Lilljeborg, 1865); *T. orchomenoides* (Stephensen, 1925); *T. oxystoma* (Stephensen, 1925); *T. propinqua* (Chevreux, 1926); *T. pusilla* (Sars, 1879); *T. rotundata* (Stephensen, 1925); *T. schneideri* (Stephensen, 1921); *T. serrata* (Schellenberg, 1931); *T. simillima* Ruffo, 1985; *T. spitzbergensis* (Chevreux, 1926); *T. triangula* (Stephensen, 1925); *T. triangularis* (K.H. Barnard, 1932).

Excluded species. Fifteen species are excluded:

Tryphosella castellata (K.H. Barnard, 1932): coxa 1 is described as 'distally widened' (K.H. Barnard 1932: 53).

T. cicadopsis (Schellenberg, 1926): the setal teeth of maxilla 1 outer plate extend well down the face of the plate, indicating a placement in Uristidae (Schellenberg 1926: fig. 22e).

T. cucullata (Walker, 1904): coxa 1 is expanded anteroventrally (Walker 1904: pl. 4, fig. 8).

T. erosa (Meinert, 1890): coxa 1 is expanded anteroventrally (Meinert 1890: fig. 25).

T. gracilipes (Stephensen, 1925): coxa 1 is "rather broad, expanded toward the apex" (Stephensen 1925: 115).

T. intermedia (Schellenberg, 1926): coxa 1 is not shortened or tapered (Schellenberg 1926: 270, fig. 17d).

T. laevis (Bonnier, 1896): coxa 1 is not shortened or tapered; maxilla 2 inner plate is much shorter than outer plate; molar appears to be a setose tongue (Bonnier 1896: pl. 35 fig. 5). This species belongs in the family Uristidae.

T. murrayi (Walker, 1903): based on examination of specimens in the Australian Museum collection (AM P.3190) this taxon has maxilla 1 outer plate setal teeth in a 7/4 crown arrangement and maxilla 2 inner plate much shorter than the outer plate so belongs in the family Uristidae and the genus *Uristes* as Hurley (1965) indicated.

T. paramoi (Schellenberg, 1931): coxa 1 is not shortened or tapered; maxilla 2 inner plate is much shorter than the outer plate (Schellenberg 1931: figs 20, 21). This species belongs in the family Uristidae.

- T. schellenbergi* Lowry & Bullock, 1976: coxa 1 is not shortened or tapered; the setal teeth of maxilla 1 outer plate extend well down the face of the plate, indicating a placement in Uristidae (Schellenberg 1931: fig. 19, as *Tmetonyx serratus*).
- T. trigonica* (Stebbing, 1888): the setal teeth of maxilla 1 outer plate extend well down the face of the plate and maxilla 2 inner plate is much shorter than the outer plate, indicating a placement in Uristidae (Stebbing 1888: pl. 9).
- T. trionyx* (Stephensen, 1925): coxa 1 is "apically somewhat expanded" (Stephensen 1925: 115).
- T. triplans* (J.L. Barnard, 1962): coxa 1 is nearly as long as coxa 2 and very slightly tapered (J.L. Barnard, 1962: fig. 18).
- T. tuberculimana* (Lagardère, 1968): coxa 1 is nearly as long as coxa 2 and only slightly tapered, gnathopod 1 carpus and propodus not like that of *Tryphosella* (Lagardère 1968: pls 1, 2).
- T. uristes* Bellan-Santini, 1997: coxa 1 is as large as coxa 2 and not tapering; maxilla 2 inner plate is much shorter than the outer plate (Bellan-Santini 1997: fig. 11). This species belongs in the family Uristidae.

Remarks. Stebbing (1906) synonymised *Pseudotryphosa* Sars, 1891 with *Uristes* Dana, 1849. Barnard & Karaman (1991) maintained *Pseudotryphosa* as a junior synonym of *Uristes* and it has remained that way until now. But the arrangement of the maxilla 1 setal-teeth, the relative lengths of the maxilla 2 plates and the strongly triturating mandibular molar are more similar to those of a tryphosine. The shortened, tapering first coxa puts *Pseudotryphosa* in the genus *Tryphosella*. We here transfer *P. umbonata* (Sars, 1883) to *Tryphosella* and regard *Pseudotryphosa* as a synonym of *Tryphosella*. See Appendix 1 for an explanation of the reversal of precedence for these two names.

Three tryphosine genera (*Cedrosella* Barnard & Karaman, 1987, *Thrombasia* J.L. Barnard, 1966 and *Tryphosella*) have molars with an asymmetrically reduced triturating column and a reduced, tapering gnathopod 1 coxae. *Cedrosella* differs from the other two genera, in among other things, the accessory flagellum which forms a cap and the weakly developed posteroventral lobe of the pereopod 4 coxa. *Thrombasia* and *Tryphosella* are very similar. They only differ in the mandibular palp which is attached distally in *Thrombasia* and midway in *Tryphosella*; in the maxilla 1 ST7 which is cuspidate distally in *Thrombasia* and cuspidate along most of the sinusoidal inner margin in *Tryphosella*; and in the telson which is moderately cleft in *Thrombasia* and deeply cleft in *Tryphosella*. Currently *Thrombasia* is in synonymy with *Schisturella* Norman, 1900 (see Barnard & Karaman 1991: 526). We see no justification for this synonymy and re-establish the genus.

Tryphosella is a world-wide genus which often dominates scavenging guilds (Lowry & Stoddart 1983; Lowry & Stoddart 1995; Lowry & Smith 2003; De Broyer *et al.* 2004). There are a number of distinctive characters, particularly in the Indo-West Pacific area, which are useful in recognising species groups. However, when a wider range of characters are considered, these "groups" are not mutually exclusive.

1. Species in which coxa 1 is small (length 1–1.4 x breadth) and subtriangular: *T. ama*, *T. astrolabensis*, *T. betka*, *T. bicheno*, *T. fortescue*, *T. freycinet*, *T. martrudan*, *T. orana*, *T. rodondo*, *T. seasana*, *T. sorell*, *T. tathra*, *T. too-woomba*.
2. Species with a long ischium on gnathopod 1: *T. ama*, *T. astrolabensis*, *T. bicheno*, *T. seasana*, *T. wongada*.
3. Species with robust setae on the callynophore and proximal articles of antenna 1: *T. astrolabensis*, *T. bet*, *T. bicheno*, *T. chinchilla*, *T. cooe*, *T. wongada*.
4. Species in which the basis of gnathopod 1 is densely setose: *T. chinchilla*, *T. cooe*, *T. rodondo*.
5. Species in which the male gnathopod 1 is simple (as opposed to subchelate): *T. betka*, *T. martrudan*, *T. too-woomba*, *T. wongaratta*.
6. Species in which some or all of the robust setae on the outer rami of uropods 1 and 2 are stout and striated: *T. fortescue*, *T. freycinet*, *T. orana*, *T. sorell*, *T. tathra*, *T. tuckanarra*.
7. Species in which the antenna 2 of the mature male is short (about as long as antenna 2, as opposed to the elongate antenna 2 of many mature lysianassoid males): *T. betka*, *T. chinchilla*, *T. martrudan*, *T. wongada*.
8. Species in which the proximal calceolus of male antenna 1 is very large compared to the subsequent calceoli: *T. camela*, *T. fortescue*, *T. sorell*.

Key to Australasian species of *Tryphosella*

1. Gnathopod 1 ischium long (length 2 or more x breadth)2
- Gnathopod 1 ischium short (length less than 2 x breadth)6
2. Uropod 2 inner ramus incised *T. ama*
- Uropod 2 inner ramus not incised3
3. Antenna 1 with robust setae on proximal articles4
- Antenna 1 without robust setae on proximal articles *T. seasana*
4. Gnathopod 2 palm transverse *T. bicheno*
- Gnathopod 2 palm obtuse5
5. Maxilliped outer plate with 1 long apical robust seta *T. wongada*
- Maxilliped outer plate with 3 long apical robust setae *T. astrolabensis*
6. Gnathopod 1 basis anterior margin densely setose7
- Gnathopod 1 basis anterior margin moderately or weakly setose9
7. Antenna 1 flagellum with robust setae on proximal articles8
- Antenna 1 flagellum without robust setae on proximal articles *T. rodondo*
8. Maxilliped outer plate with 2 long apical robust setae; uropod 3 peduncle with 2 short apicomедial robust setae *T. cooe*
- Maxilliped outer plate with 3 long apical robust setae; uropod 3 peduncle with 3 short apicomедial robust setae *T. chinchilla*
9. Gnathopod 2 palm transverse10
- Gnathopod 2 palm obtuse12
10. Uropods 1 and 2 outer ramus with all robust setae stout and striated; uropod 3 peduncle with 1 short apicomедial robust seta *T. sorell*
- Uropods 1 and 2 outer ramus with only distal robust setae stout and striated; uropod 3 peduncle with 2 short apicomедial robust setae11
11. Maxilliped outer plate with 3 apical robust setae; coxa 1 small (length about 1.1 x breadth); telson with 2 apical robust setae on each lobe *T. fortescue*
- Maxilliped outer plate with 2 apical robust setae; coxa 1 medium (length about 1.5 x breadth); telson with 1 apical robust seta on each lobe *T. tuckanarra*
12. Telson without dorsal robust setae *T. oupi*
- Telson with dorsal robust setae13
13. Uropods 1 and 2 outer ramus with some or all robust setae stout and striated14
- Uropods 1 and 2 outer ramus without stout, striated robust setae16
14. Uropods 1 and 2 outer ramus with all robust setae stout and striated *T. freycinet*
- Uropods 1 and 2 outer ramus with only distal robust setae stout and striated15
15. Epistome produced beyond upper lip; gnathopod 1 carpus subequal to propodus; epimeron 3 posteroventral corner narrowly rounded *T. orana*
- Epistome produced equally with upper lip; gnathopod 1 carpus longer than propodus; epimeron 3 posteroventral corner subquadrate *T. tathra*
16. Telson with 1 apical robust seta on each lobe17
- Telson with 2 apical robust setae on each lobe *T. toowoomba*
17. Coxa 1 small (length less than 1.5 x breadth)18
- Coxa 1 medium size (length at least 1.5 x breadth)19
18. Maxilliped outer plate with 1 long apical robust seta *T. betka*
- Maxilliped outer plate with 1 short apical robust seta *T. martrudan*
19. Epimeron 3 posteroventral corner subquadrate20
- Epimeron 3 posteroventral corner acutely produced21
20. Maxilliped outer plate with 2 apical robust setae; boss on urosomite 1 laterally robust *T. camela*
- Maxilliped outer plate with 3 apical robust setae; boss on urosomite 1 laterally very thin *T. cameloides*
21. Maxilliped outer plate with 2 long apical robust setae22
- Maxilliped outer plate with 1 short apical robust seta *T. wagaratta*
22. Antenna 1 with robust setae on proximal articles; uropod 3 peduncle with 1 short apicomедial robust seta *T. bet*
- Antenna 1 without robust setae on proximal articles; uropod 3 peduncle with 2 short apicomедial robust setae *T. flynnana*

Tryphosella bet Lowry & Stoddart, 2009

Tryphosella sp. 2. —Keable, 1995: 42.

Tryphosella sp. 128. —Lowry & Smith, 2003: 56.

Tryphosella bet Lowry & Stoddart, 2009: 581, figs 13, 14.

Type locality. Bet Reef, Torres Strait, Queensland, Australia, 10°10.54'S 142°56.01'E, 20 m depth.

Material examined. *Western Australia*: 40 specimens, WAM C46166 and 10 specimens, AM P.85306, High Clifty Island, Kimberley coast, approx. 15°54.77'S 124°20.68'E, baited trap, 22 November 1994, F. Wells, stn Wells 16.

Remarks. *Tryphosella bet* is a shallow-water tropical scavenger (20 to 50 m depth) which occurs along the Great Barrier Reef, the Torres Strait, across the top-end and, with the new record reported here, onto the north-western Kimberley coast of Australia.

Distribution. Tropical Australia, 20–50 m depth.

***Tryphosella betka* sp. nov.**

(Figs 7–9)

Tryphosella sp. 368. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, ovigerous (2 eggs), 4.4 mm, AM P.69292, off Betka Beach, Mallacoota, Victoria, Australia, 37°35.3'S 149°45'E, 8 m, baited trap, clean sand and algal detritus in trap, set 1600 hrs, retrieved 1015 hrs, 29–30 November 1988, J.K. Lowry & S.J. Keable, stn NSW-401. PARATYPES: 1 male, 5.0 mm, AM P.69293; 47 females, 28 males, AM P.69294; same data as Holotype. 207 specimens, AM P.69296, close in to Bastion Point, Mallacoota, Victoria, Australia, 37°35'S 149°46.5'E, 12 m, baited trap, set 1600 hrs, retrieved 1015 hrs, 29–30 November 1988, J.K. Lowry & S.J. Keable, stn NSW-396. 1 male, 4.5 mm, MV J62288 and 6 males, MV J62289, Crib Point, Western Port, Victoria, Australia, 38°20.67'S 145°14.74'E, 9 m, sand, Smith-McIntyre grab, 4 March 1965, Marine Studies Group, Fisheries and Wildlife Department, Ministry for Conservation, Victoria, CPBS stn 24N; 1 male, MV J62287, same locality and collector, 38°21.35'S 145°13.36'E, 10 m, muddy sand, Smith-McIntyre grab, 9 March 1965, CPBS stn 21S; 1 male, MV J3510, same locality and collector, 38°21.63'S 145°15.08'E, 9 m, sand, Smith-McIntyre grab, 23 February 1965, CPBS stn 25S.

Type locality. Off Betka Beach, Mallacoota, Victoria, Australia, 37°35.3'S 149°45'E, 8 m depth.

Etymology. The species is named for its type locality.

Diagnostic description. *Head* lateral cephalic lobe subtriangular, apically rounded; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field calynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, broadly rounded; upper lip produced, rounded apically. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right very slightly asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 1 long apical robust seta.

Gnathopod 1 subchelate; coxa small (length 1.2 x breadth), subtriangular, tapering distally; basis sparsely setose along anterior margin; ischium short; carpus short, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm transverse, entire, convex. **Gnathopod 2** palm moderately obtuse. **Pereopod 4** coxa without distinct lateral ridge, with a well-developed posteroventral lobe. **Pereopod 5** coxa without distinct lateral ridge, without umbo; basis about as long as broad, without photophore, not posteroproximally excavate, posterior margin weakly serrate. **Pereopod 7** basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. **Epimeron 3** posterior margin smooth, posteroventral corner narrowly rounded. **Urosomite 1** not projecting over urosomite 2, with anterodorsal notch and slightly rounded boss. **Uropods 1 and 2** outer rami without stout striated robust setae. **Uropod 2** inner ramus without constriction. **Uropod 3** peduncle without dorsolateral flange, with 2 short apicomедial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. **Telson** deeply cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Antenna 1* calceoli present, proximal calceoli very large. *Antenna 2* peduncular articles 4 and 5 enlarged, calceoli present, proximal calceoli larger than distal calceoli. **Gnathopod 1** simple; propodus margins tapering distally, palm absent. **Gnathopod 2** propodus palm slightly obtuse.

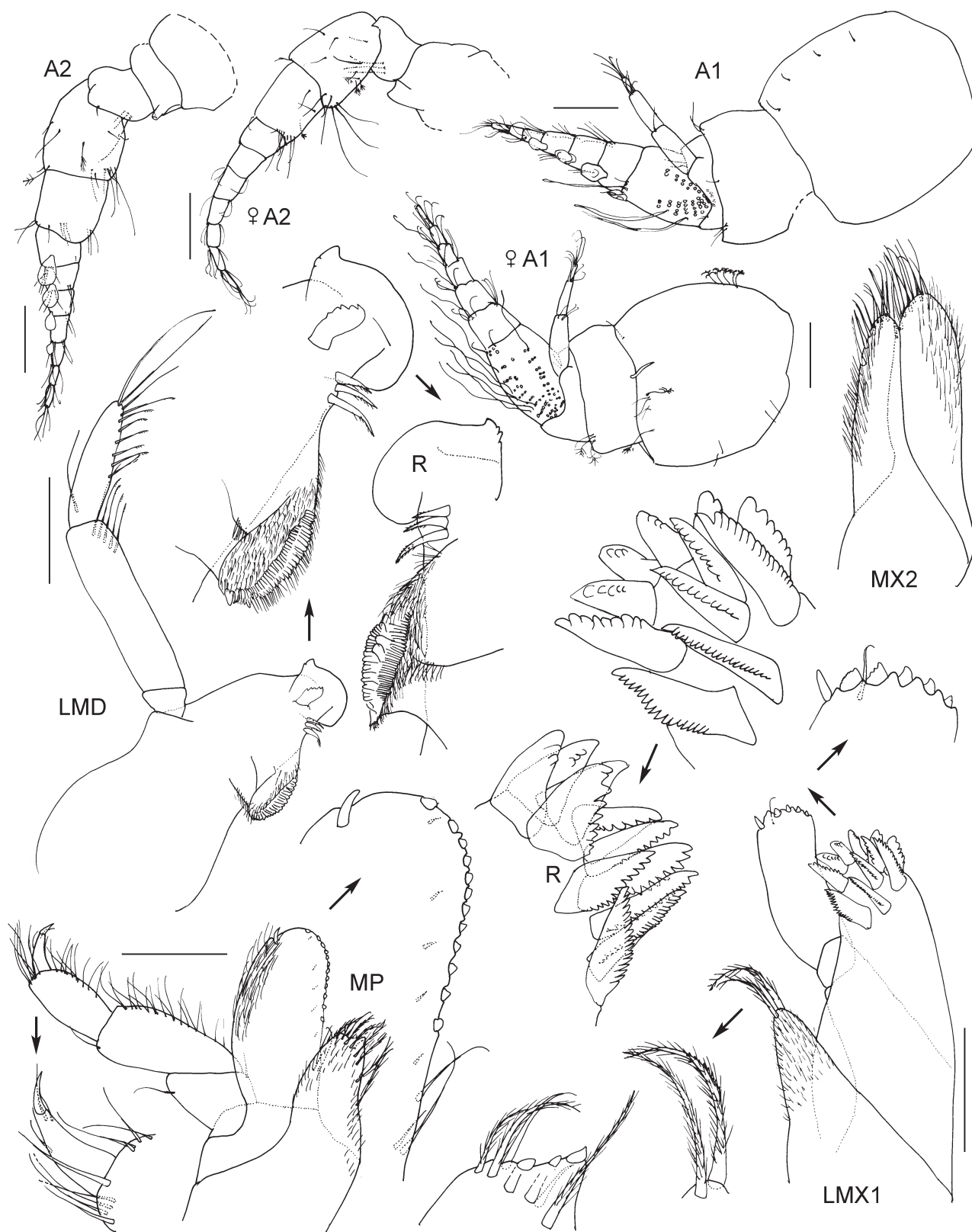


FIGURE 7. *Tryphosella betka* **sp. nov.** Paratype, male, 4.5 mm, MV J62288, Crib Point, Western Port, Victoria; holotype, female, 4.4 mm, AM P.69292, Mallacoota Inlet, Victoria. Scales represent 0.1 mm.

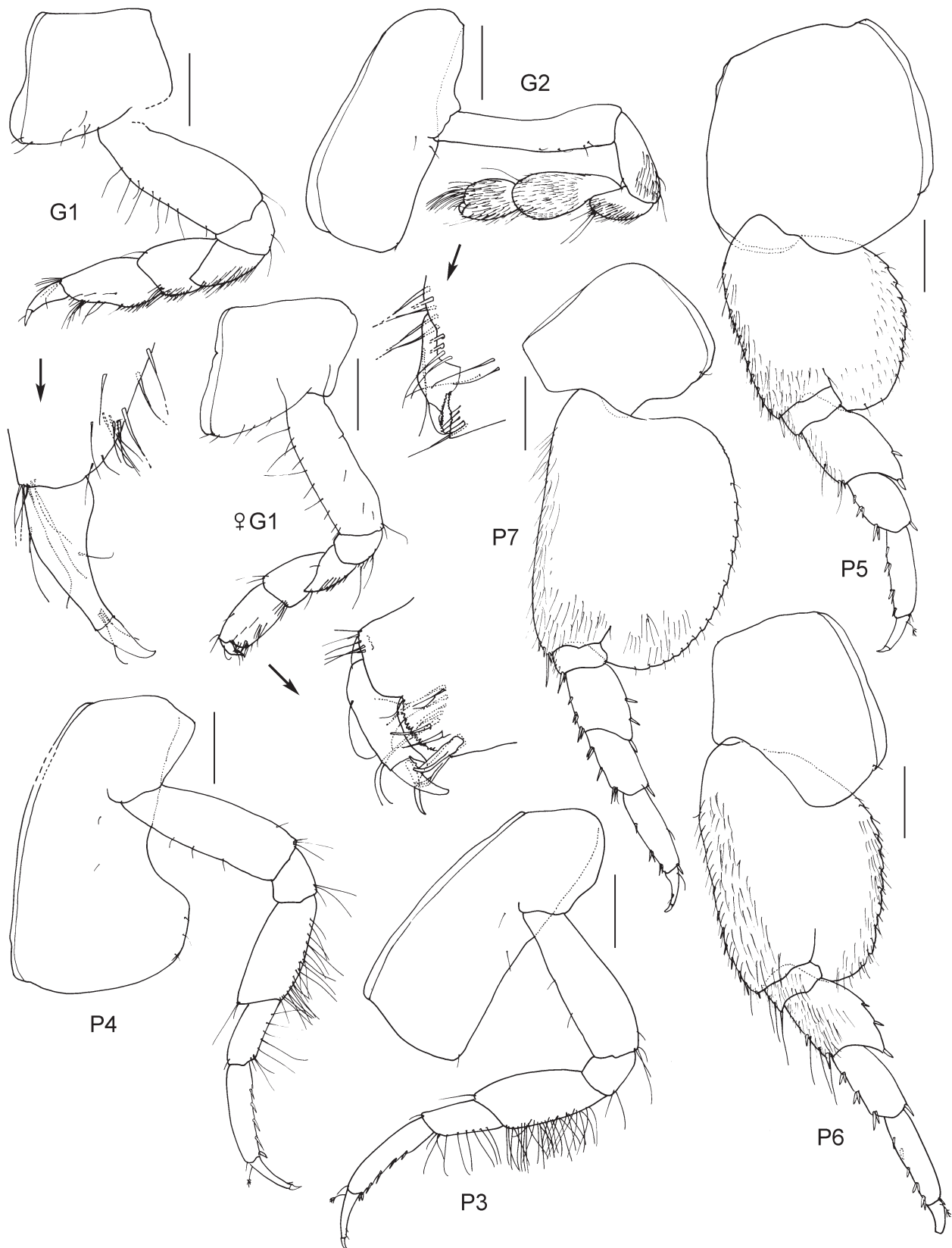


FIGURE 8. *Tryphosella betka* **sp. nov.** Paratype, male, 4.5 mm, MV J62288, Crib Point, Western Port, Victoria; holotype, female, 4.4 mm, AM P.69292, Mallacoota Inlet, Victoria. Scales represent 0.2 mm.

Remarks. *Tryphosella betka* belongs to a group of 13 Indo-West Pacific species that have a significantly reduced coxa 1. It also belongs to a small group of four Australian species (*T. betka*, *T. martrudan*, *T. toowoomba* and *T. wangeratta*) that have a simple first gnathopod in the male. *Tryphosella betka* is distinguished from *T. wangeratta* by the size of coxa 1 (*T. betka*, *T. martrudan* and *T. toowoomba* all have a small coxa 1). *Tryphosella betka* differs from *T. martrudan* in having a slightly rounded boss on urosomite 1 (a posteriorly-directed elongate rounded boss in *T. martrudan*) and a narrowly rounded posteroventral corner on epimeron 3 (produced and acute in *T. martrudan*). The males of *T. betka* differ from those of *T. martrudan* in having the proximal calceoli on antennae 1 and 2 much larger than the distal calceoli. In both species the adult male antenna 2 is short, an unusual character in the genus *Tryphosella*. *Tryphosella betka* differs from *T. toowoomba* in the shape of the epistome and upper lip, the length of the apical robust setae on the maxilliped outer plate (long in *T. betka*, short in *T. toowoomba*), the shape of epimeron 3 posteroventral corner (narrowly rounded in *T. betka*, produced and acute in *T. toowoomba*) and the number of apical robust setae on the telson (one on each lobe in *T. betka*, two in *T. toowoomba*). Adult males of *T. betka* also differ from *T. toowoomba* in not having any plumose setae on the rami of uropod 3, another unusual character in the genus *Tryphosella* which also occurs in *T. chinchilla* and *T. tuckanarra*.

Tryphosella betka appears to be a common shallow-water scavenger in south-eastern Australia, south of Mallacoota.

Distribution. South-eastern Australia, 8–12 m depth.

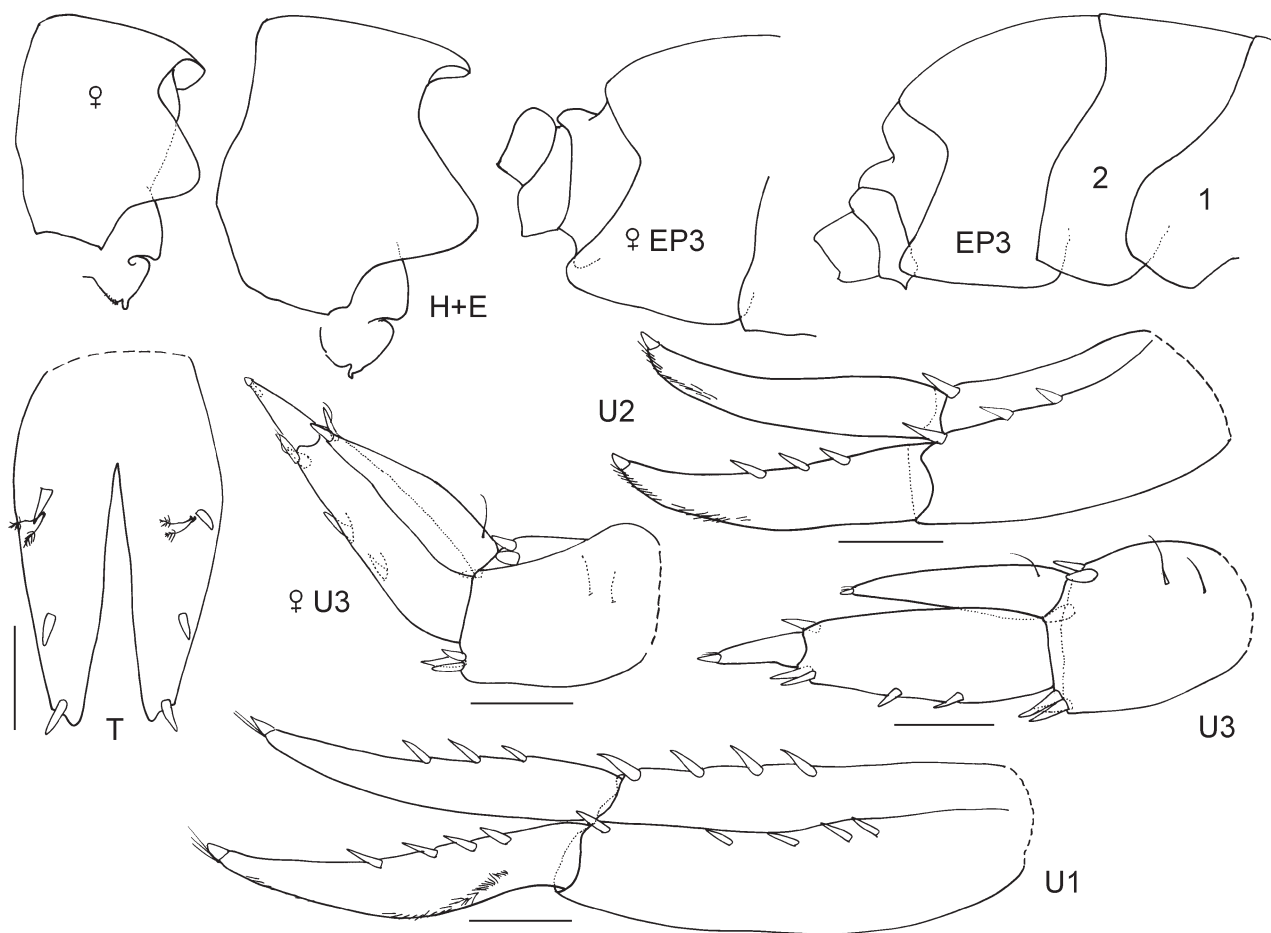


FIGURE 9. *Tryphosella betka* sp. nov. Paratype, male, 4.5 mm, MV J62288, Crib Point, Western Port, Victoria; holotype, female, 4.4 mm, AM P.69292, Mallacoota Inlet, Victoria. Scales represent 0.2 mm.

***Tryphosella bicheno* sp. nov.**

(Figs 10–12)

Tryphosella sp. 168/182. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, 7.0 mm, P.70514, east of Fortescue Bay, Tasmania, Australia, 43°8.96'S 145°15.36'E, 1000 m, baited trap, 5.1°C, 17–18 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-384. PARATYPES: 1 female, 7.2 mm, AM P.70513; 1 male, 7.5 mm, AM P.70515; 1 male, 6.4 mm, AM P.70516; 1 female, 4.6 mm, AM P.70517; 1 male, 4.6 mm, AM P.70518; 1 ?female, 4.2 mm, AM P.70519; 1 ?male, 4.1 mm, AM P.70520; 1 female, 7.8 mm, AM P.70521; 2242 specimens, P.51935; all with same data as Holotype. 1611 specimens, P.51934, same data, stn TAS-383; 21 specimens, P.51928, same data, 16–17 April 1993, stn TAS-365; 69 specimens, P.51929, same data, stn TAS-367.

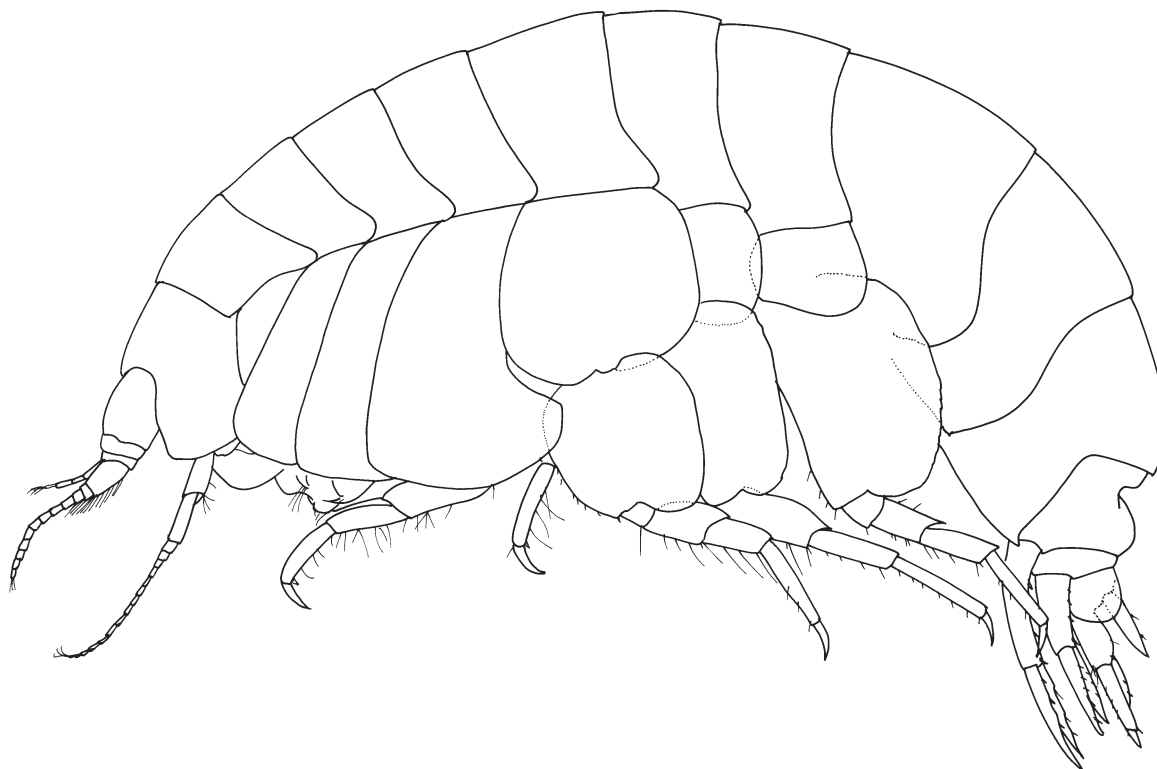


FIGURE 10. *Tryphosella bicheno* sp. nov. Paratype, female, 7.2 mm, P.70513, east of Fortescue Bay, Tasmania.

Additional material examined. *Queensland*: 5 specimens, P.58073, east of Flynn Reef, 16°41.61'S 146°17.94'E, 100 m, baited trap, 6–7 June 1993, J.K. Lowry, P. Freewater & W. Vader, RV *Sunbird*, stn QLD-918; 8 specimens, P.58071, same data, stn QLD-936; 971 specimens, P.57744, same locality, 50 m, baited trap, 18–19 May, 1994 J.K. Lowry & K. Dempsey, RV *Sunbird*, stn QLD-1033. *New South Wales*: 1 specimen, P.44409, off Wollongong, 34°32.53'S 151°17.07'E, 400 m, baited trap, 6–7 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-787; 4 specimens, P.44435 and 1 specimen, P.44446, off Wollongong, 34°32.39'S 151°15.00'E, 300 m, baited trap, 7–8 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-802; 2 specimens, P.44420, off Wollongong, 34°33.01'S 151°16.54'E, 400 m, baited trap, 7–8 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-804. *Tasmania*: 4 specimens, MV J62304, off Freycinet Peninsula, 41°58.60'S 148°38.80'E, 500 m, coarse shell, WHOI epibenthic sled, M.F. Gomon *et al.*, 27 July 1986, RV *Franklin*, stn SLOPE 47; 4 specimens, P.51936, mouth of Fortescue Bay, 43°07.77'S 145°59.47'E, 50 m, baited trap, 16.6°C, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-387; 33 specimens, P.57706, east of Fortescue Bay, north of Hippolyte Rocks, 43°6.70'S 148°03.45'E, 100 m, baited trap, 17–18 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-372; 2 specimens, P.52239 and 12 specimens, P.58241, same locality, 100 m, baited trap, 8–9 April 1994, 15.6°C, J.K. Lowry & K. Dempsey on MV *Martrudan*, stn TAS-389; 3 specimens, P.57704, east of Fortescue Bay, 43°06.70'S 145°13.6'E, 200 m, baited trap, 16–17 April 1993, J.K. Lowry & P. Freewater, 16–17 April 1993, MV *Tasmanian Enterprise*, stn TAS-356; 2 specimens, P.57705, same data, stn TAS-357; 1 specimen, P.57707, same data, 17–18 April 1993, stn TAS-376; 7 specimens, P.51937 and 17 specimens, P.57711, same locality, 200 m, baited trap, 13.2°C, J.K. Lowry & K. Dempsey, MV *Martrudan*, 8–9 April 1994, stn TAS-392; 1 specimen, P.51938, same data, stn TAS-393; 30 specimens, P.51226, same data, stn

TAS-394; 1 specimen, P.51944, same data, 9–10 April 1994, stn TAS-412; 64 specimens, P.51925, east of Fortescue Bay, 43°09.37'S 145°13.6'E, 300 m, baited trap, 16–17 April 1993, J.K. Lowry & P. Freewater, 16–17 April 1993, MV *Tasmanian Enterprise*, stn TAS-359; 30 specimens, P.51926, same data, stn TAS-361; 11 specimens, P.51930, same data, 17–18 April 1993, stn TAS-377; 3 specimens, P.51931, same data, stn TAS-378; 1414 specimens, P.51939, same locality, 300 m, baited trap, 11.0°C, J.K. Lowry & K. Dempsey, MV *Martrudan*, 8–9 April 1994, stn TAS-395; 758 specimens, P.51235, same data, stn TAS-396; 459 specimens, P.51940, same data, stn TAS-397; 274 specimens, P.51945, same data, 9–10 April 1994, stn TAS-414; 247 specimens, P.51946, same data, stn TAS-415; 1269 specimens, P.51022, east of Fortescue Bay, 43°07.36'S 145°13.75'E, 400 m, baited trap, 16–17 April 1993, J.K. Lowry & P. Freewater, 16–17 April 1993, MV *Tasmanian Enterprise*, stn TAS-362; 1707 specimens, P.51927, same data, stn TAS-364; 1003 specimens, P.51932, same data, 17–18 April 1993, stn TAS-380; 234 specimens, P.51933, same data, stn TAS-382; 537 specimens, P.51941, same locality, 400 m, baited trap, 10.0°C, J.K. Lowry & K. Dempsey, MV *Martrudan*, 8–9 April 1994, stn TAS-398; 885 specimens, P.51942, same data, stn TAS-399; 1457 specimens, P.51943, same data, stn TAS-400; 1337 specimens, P.51947, same data, 9–10 April 1994, stn TAS-417; 1531 specimens, P.51948 and 1 specimen, P.71633, same data, stn TAS-418.

Type locality. East of Fortescue Bay, Tasmania, Australia, 43°08.96'S 145°15.36'E, 1000 m depth.

Etymology. The species is named for the town of Bicheno on the east coast of Tasmania.

Diagnostic description. *Head* lateral cephalic lobe a semidome, apically rounded; eyes lageniform but fading completely in alcohol. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field calynophore, **robust setae present on proximal articles**; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, broadly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally tritulating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right slightly asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 1 long apicolateral seta and 3 long apical robust setae.

Gnathopod 1 subchelate; **coxa small (length 1.3 x breadth), subtriangular, tapering distally; basis moderately setose along anterior margin; ischium long**; carpus long, longer than propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm moderately acute, entire, straight. *Gnathopod 2* palm transverse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, without photophore, not posteroproximally excavate, posterior margin weakly serrate. *Pereopod 7* basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. *Epimeron 3* posterior margin smooth, **posteroventral corner acutely produced**. *Urosomite 1* not projecting over urosomite 2, **with anterodorsal notch and rounded boss**. *Uropods 1 and 2* outer rami without stout striated robust setae. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange, with 2 short apicomедial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. *Telson* deeply cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). Head lateral cephalic lobe subtriangular. *Antenna 1* calceoli present, small. *Antenna 2* flagellum long, calceoli present. *Uropod 3* with plumose setae on both rami.

Remarks. *Tryphosella bicheno* appears to be most similar to *T. astrolabensis* and *T. wongada* (both from northern Papua New Guinea). They all have a long ischium on gnathopod 1, robust setae on the proximal articles of antenna 1 flagellum, an acutely produced posteroventral corner on epimeron 3 and a rounded boss on urosomite 1. *Tryphosella bicheno* differs from *T. astrolabensis* and *T. wongada* in having 1 long apicolateral and 3 long apical setae on the maxilliped outer plate, a transverse palm on gnathopod 2 and only 1 apical robust seta on each lobe of the telson.

Tryphosella bicheno is a scavenger along the east coast of Australia. It occurred in 50 to 100 m depth off the Great Barrier Reef (up to 970 specimens in a trap) and in small numbers off the New South Wales central coast in 300 to 400 m depth (up to 5 specimens in a trap). Off the Tasmanian coast it occurred in small numbers from 50 to 200 m depth (up to 65 specimens in a trap), but most frequently and in the highest numbers in depths from 300 to 1000 m (up to 2250 specimens in a trap).

Distribution. Queensland to Tasmania, eastern Australia; 50–1000 m depth.

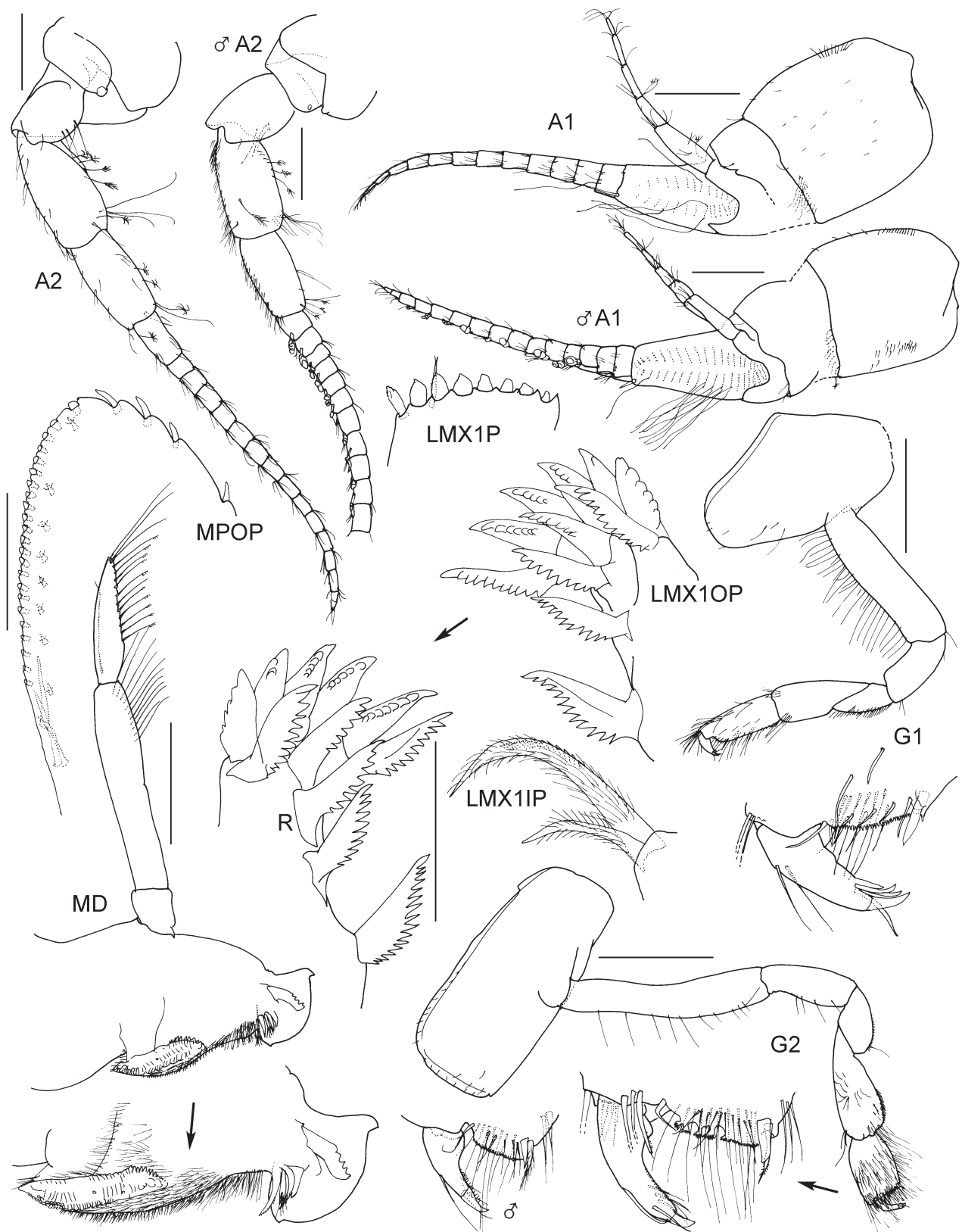


FIGURE 11. *Tryphosella bicheno* **sp. nov.** Holotype, female, 7.0 mm, P.70514; paratype, male, 7.5 mm, AM P.70515; east of Fortescue Bay, Tasmania. Scales for G1, G2 represent 0.5 mm, remainder represent 0.2 mm.

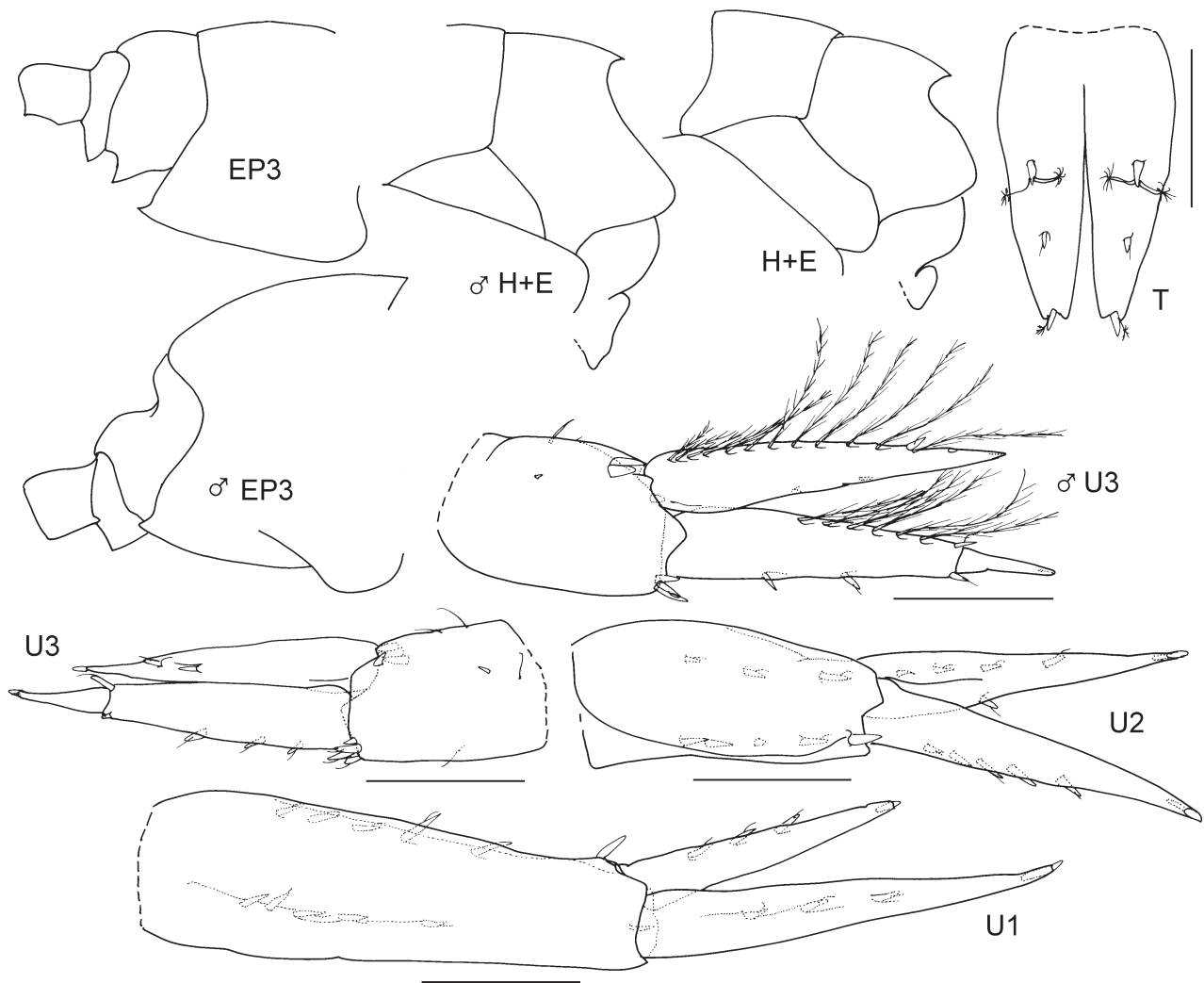


FIGURE 12. *Tryphosella bicheno* sp. nov. Holotype, female, 7.0 mm, P.70514; paratype male, 7.5 mm, AM P.70515; east of Fortescue Bay, Tasmania. Scales represent 0.2 mm.

***Tryphosella camela* (Stebbing, 1910)**
(Figs 13–16)

Tryphosa camelus Stebbing, 1910: 574, pl. 47A. —Sheard, 1937: 19. —J.L. Barnard, 1962: 29, 30 (key). —Springthorpe & Lowry, 1994: 11.

Tryphosa nana. Chilton, 1921: 43.

Tryphosella camela. —Hutchings *et al.*, 1989: 362. —Barnard & Karaman, 1991: 537.

Tryphosella camela. —Lowry & Smith, 2003: 56. —Lowry & Stoddart, 2003: 171.

Type material examined. SYNTYPE, female, AM P.2470, 5.5–6.5 km off Wattamolla, New South Wales, Australia, 34°10'S, 151°11'E, 99–108 m, mud, trawl, 22 March 1898, E.R. Waite, H.M.C.S. *Thetis*, stn 57.

Additional material examined. *Queensland*: 1 ovigerous female, AM P.49513, east of Flynn Reef, 16°40.82'S 146°18.81'E, 200 m, baited trap, 7–8 June 1993, J.K. Lowry, P. Freewater & W. Vader, RV *Sunbird*, stn QLD-939; 1 specimen, AM P.58056, east of Flynn Reef, 16°41.61'S 146°17.94'E, 50 m, baited trap, 25.9°C, 18–19 May 1994, J.K. Lowry & K. Dempsey, RV *Sunbird*, stn QLD-1032; 1 adult male, AM P.47812, east of Mooloolaba, 26°36.21'S 153°34.90'E, 116 m, baited trap, 20.4°C, 2–3 August 1994, J.K. Lowry & K. Dempsey, MV *Capricorn I*, stn QLD-1125; 6 specimens, AM P.47925, same data, 3–4 August 1994, J.K. Lowry & K. Dempsey, MV *Capricorn I*, stn QLD-1145; 4 specimens, AM P.47928, same data, stn QLD-1147; 2 males, AM P.48019, east of Mooloolaba, 26°36.21'S 153°34.90'E, 100 m, baited trap, 17.2°C, 2–3 July 1995, J.K. Lowry & K. Dempsey, MV

Capricorn I, stn QLD-1198; 2 females, AM P.48030, same data, stn QLD-1199. *New South Wales*: 6 specimens, AM P.55972, due east of Coffs Harbour, 30°17.49'S 153°13.90'E, 45.4 m, baited trap, 11–12 August 1993, P. Berents, R.T. Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-873; 1 specimen, AM P.55974, north-east of Coffs Harbour, 30°15.75'S 153°21.98'E, 98 m, baited trap, set 1520 hrs, retrieved 1115 hrs, 12–13 August 1993, P. Berents, R.T. Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-885; 1 specimen, AM P.52618, same data, stn NSW-886; 2 specimens, AM P.52648, same data, stn NSW-887; 1 ovigerous female and 1 adult male, AM P.48203, north-east of Coffs Harbour, 30°15.94'S 153°21.90'E, 100 m, baited trap, 18.6°C, 8–9 September 1994, J.K. Lowry & K. Dempsey, MV *Carrie Anne*, stn NSW-984; 1 female, AM P.48187, same data, stn NSW-985; 6 specimens, AM P.48429, same data, 9–10 September 1994, stn NSW-1006; 4 females, AM P.48410, same data, stn NSW-1007; 1 male, 4.4 mm, AM P.69405 and 6 males, AM P.69406, east of Newcastle, 32°53'S 152°35'E, 165 m, bottom tow with plankton net, 15 August 1985, FRV *Kapala*, stn K85-12-23; 1 specimen, AM P.69407, east of Long Reef Point, 33°43'S 151°46'E to 33°44'S 151°46'E, 174 m, epibenthic sled, 20 December 1985, J.K. Lowry & R.T. Springthorpe, FRV *Kapala*, stn K85-21-08; 1 female, ovigerous (4 eggs), 4.0 mm, AM P.69404, east of Port Jackson, 33°52'S 151°23'E, 80 m, shelly mud, epibenthic sled, 11 December 1980, R.T. Springthorpe, FRV *Kapala*, stn K80-20-11; 1 specimen, AM P.41960, 800–1000 m off Port Botany, east side of Botany Bay, 33°58.75'S 151°11.03'E, 7 m, Smith-McIntyre grab, Australian Museum Party, April or July 1992, stn NSW-769; 1 specimen, AM P.69394, Cape Banks, 34°00'S 151°16'E, 65–70 m, The Ecology Lab, January 1991, stn S2T3-185; 2 specimens, AM P.69408, Gibbon Point, Port Hacking, 34°05'S 151°10'E, 15 m, sediment and algae scrapings from rocky substrate, J.K. Lowry & R.T. Springthorpe, 13 August 1981, stn NSW-76; 2 specimens, AM P.69396, south-east of Bate Bay, 34°05.9'S 151°12'E, 65–70 m, The Ecology Lab, July 1990, stn S2T2; 1 specimen, AM P.69397, south-east of Bate Bay, 34°06.8'S 151°11'E, 65–70 m, The Ecology Lab, July 1990, stn S3T2-R2; 1 female, AM P.69398, off Providential Head, Wattamolla, 34°08'S 151°08.5'E, 25–30 m, Smith-Macintyre grab, January 1990, The Ecology Lab, stn S2P2; 1 specimen, AM P.52936, same data, stn S2P3; 1 specimen, AM P.69395, Bass Point, 34°36'S 150°54'E, 45–50 m, The Ecology Lab, January 1991, stn S2T4-R1; 1 specimen, AM P.46872, off Wollongong, 34°28.15'S 151°02.37'E, 100 m, baited trap, 15.5°C, 6–7 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-776; 2 specimens, AM P.69399, near Moona Moona Creek, Jervis Bay, 35°03.5'S 150°41'E, 4.6 m, kelp holdfasts, 15 August 1981, P.B. Berents, stn NSW-87; 1 ovigerous female, 4.7 mm, AM P.69402, 1 ovigerous female and 2 mature males, AM P.69403, near mouth of Moona Moona Creek, Jervis Bay, 35°03.5'S 150°41'E, 8 m, plankton net by hand along bottom, 2100 hrs, 1 December 1983, P.B. & P.M. Berents, stn NSW-1036; 1 ovigerous female, AM P.69400, Jervis Bay, approx. 35°03'S 150°44'E, 18 m, red algal turf, 5 November 1978, N. Coleman, stn NSW-222; 1 specimen, AM P.36210, Murrumbulga Point, Twofold Bay, 37°04'42"S 149°53'06"E, subtidal rock platform, 11 December 1984, S.J. Keable & E.A. Bamber, stn Q2; 1 specimen, AM P.36016, same locality, 1.5 m, subtidal rock platform, 9 October 1984, P.A. Hutchings, stn Q5; 1 specimen, AM P.36017, north-west of Tararago Point, Twofold Bay, 37°05'S 149°56'E, 23.8 m, 20 February 1985, S.J. Keable & E.L. Albertson, stn E-107. *Victoria*: 2 females, MV J62305, south of Point Hicks, 38°17.70'S 149°11.30'E, 400 m, coarse sand, gravel, mud, many sponges, WHOI epibenthic sled, 24 July 1986, M.F. Gomon *et al.*, RV *Franklin*, stn SLOPE 40. *Tasmania*: 1 ovigerous female and 1 male, MV J2684, 42 km south-west of Babel Island, eastern Bass Strait, 40°14.4'S 148°40.0'E, 60 m, muddy sand, grab, 14 November 1981, R. Wilson, RV *Tangaroa*, stn BSS-165G; 3 specimens, MV J2685, same data, dredge, stn BSS-165D; 8 specimens, MV J2686, 20 km north-north-east of North Point, central Bass Strait, 40°38.0'S 145°23'E, 36 m, muddy shell grit, grab, 4 November 1980, M. Gomon & G.C.B. Poore, FRV *Sarda*, stn BSS 117G; 3 males, MV J2687, same data, epibenthic sled, stn BSS 117S; 1 specimen, MV J62306, off Freycinet Peninsula, 41°57.50'S 148°37.90'E, 400 m, coarse shell, WHOI epibenthic sled, 27 July 1986, M.F. Gomon *et al.*, RV *Franklin* stn SLOPE 48; 1 specimen, AM P.51949, east of Fortescue Bay, north of Hippolyte Rocks, 43°06.70'S 148°03.45'E, 100 m, baited trap, 15.6°C, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-390; 1 specimen, AM P.51950, east of Fortescue Bay, 43°07.36'S 145°13.75'E, 400 m, baited trap, 10.0°C, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-400.

Type locality. 5.5–6.5 km off Wattamolla, New South Wales, Australia, [approximately 34°10'S 151°11'E], 99–108 m depth.

Diagnostic description. *Head* lateral cephalic lobe subtriangular, apically rounded; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; **flagellum with weak 2-field callynophore**, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; peduncular articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced slightly beyond upper lip, broadly rounded; upper lip not

produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; article 3 with proximal A3-seta. *Maxilla 1* setal-tooth 7 left and right symmetrical, cuspidate along most of sinusoidal inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 2 short apical robust setae.

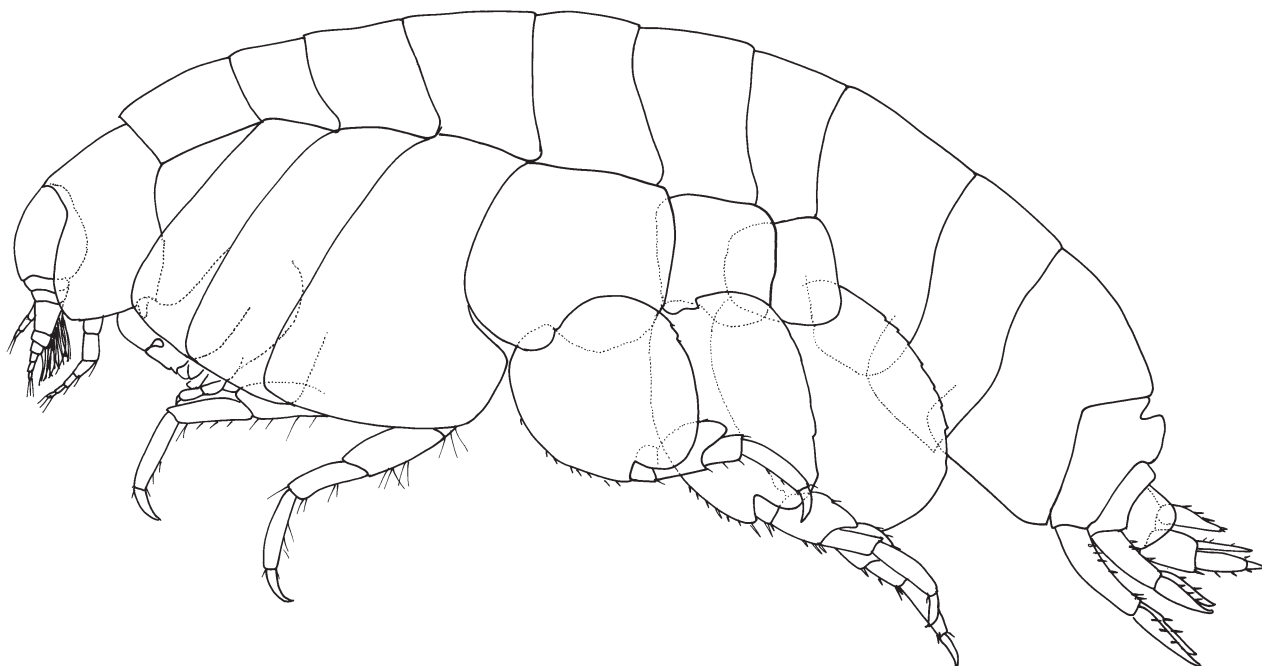


FIGURE 13. *Tryphosella camela* (Stebbing, 1910). Female, 4.5 mm, AM P.69402, Jervis Bay, New South Wales.

Gnathopod 1 subchelate; **coxa medium length (length 1.6 x breadth), subtriangular, tapering distally**; basis sparsely setose along anterior margin; ischium short; carpus long, subequal in length to propodus, without posterior lobe; margins subparallel, **palm slightly acute**. *Gnathopod 2* palm slightly obtuse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, without photophore, not posteroproximally excavate, posterior margin weakly serrate. *Pereopod 7* basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. **Epimeron 3** posterior margin smooth, **posteroventral corner subquadrate**. **Urosomite 1 with deep notch and subtriangular, subacute boss**. *Uropods 1 and 2* outer rami without stout striated robust setae. *Uropod 2* inner ramus without constriction. *Uropod 3* **peduncle** without dorsolateral flange, **with 1 short apicomedial robust seta**; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. **Telson moderately cleft**, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Head* lateral cephalic lobe a semidome, apically truncated. *Antenna 1* flagellum with strong 2-field callynophore; calceoli present, proximal calceolus very large. *Antenna 2* peduncular articles 4 and 5 enlarged, proximal calceolus very large; flagellum long, calceoli present. *Uropod 3* with plumose setae on both rami.

Remarks. *Tryphosella camela* is most similar to *T. cameloides* Lowry & Stoddart, 2009. Both species have a distinctive subtriangular, subacute boss on urosomite 1. In *T. camela* this boss is more robust and is preceded by a very deep incision whereas in *T. cameloides* the boss is laterally very thin. The two species also differ slightly in the shape of the basis of pereopods 5 to 7 and in the number of apical robust setae on the maxilliped outer plate (two in *T. camela*, three in *T. cameloides*).

Tryphosella camela occurred in low numbers (1–6 specimens) from 50 to 200 m depth from northern Queensland to southern Victoria. In Bass Strait and Tasmania it occurred in samples down to 400 m depth, but still in low numbers. Although it was taken in baited traps all along the coast it was also captured in sledges and grabs.

Distribution. Eastern Australia, from north Queensland to Tasmania, 1.5–400 m depth.

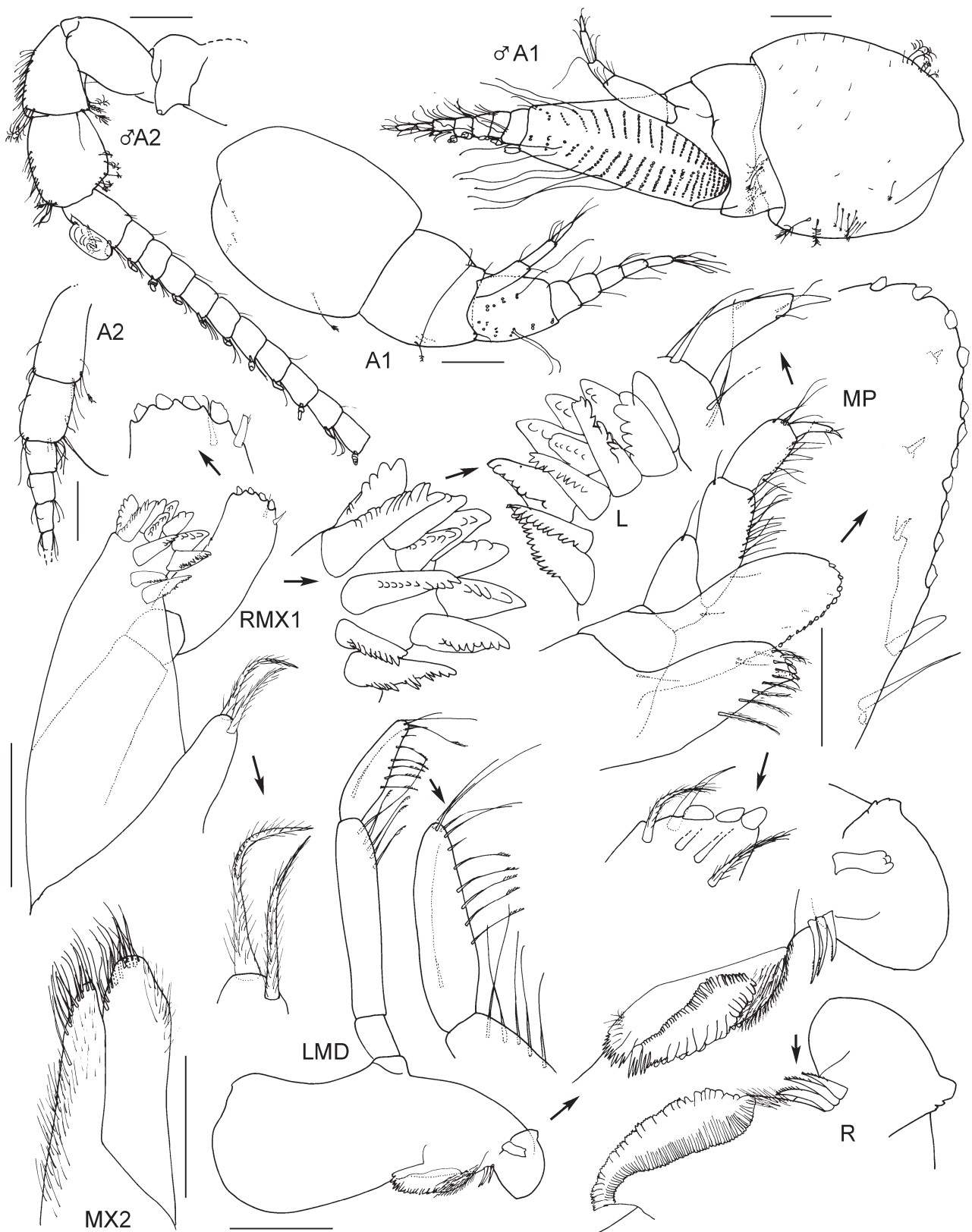


FIGURE 14. *Tryphosella camela* (Stebbing, 1910). Female, 4.0 mm, AM P.69404, east of Port Jackson, New South Wales; male, 4.4 mm, AM P.69405, east of Newcastle, New South Wales. Scales represent 0.1 mm.

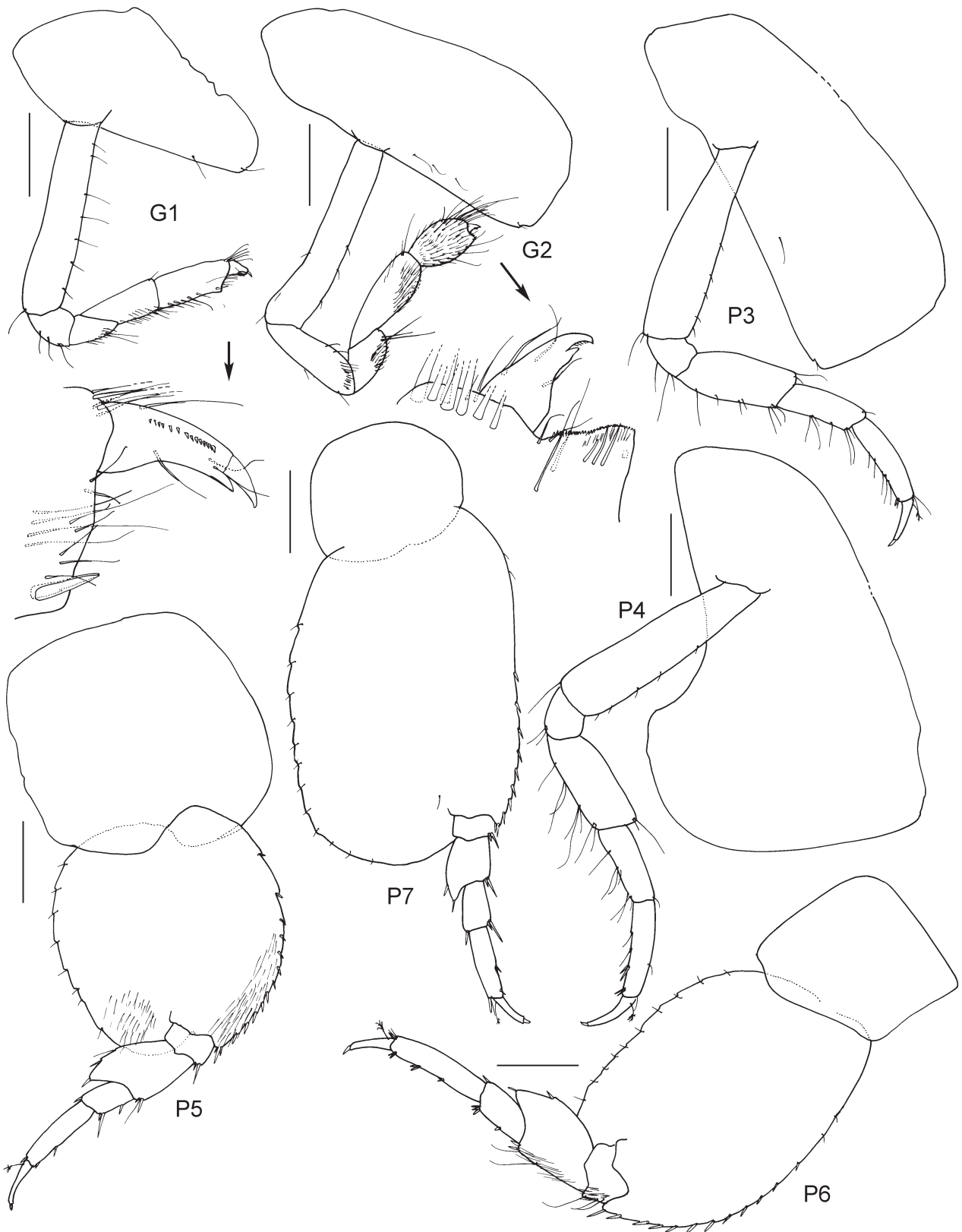


FIGURE 15. *Tryphosella camela* (Stebbing, 1910). Female, 4.0 mm, AM P.69404, east of Port Jackson, New South Wales. Scales represent 0.2 mm.

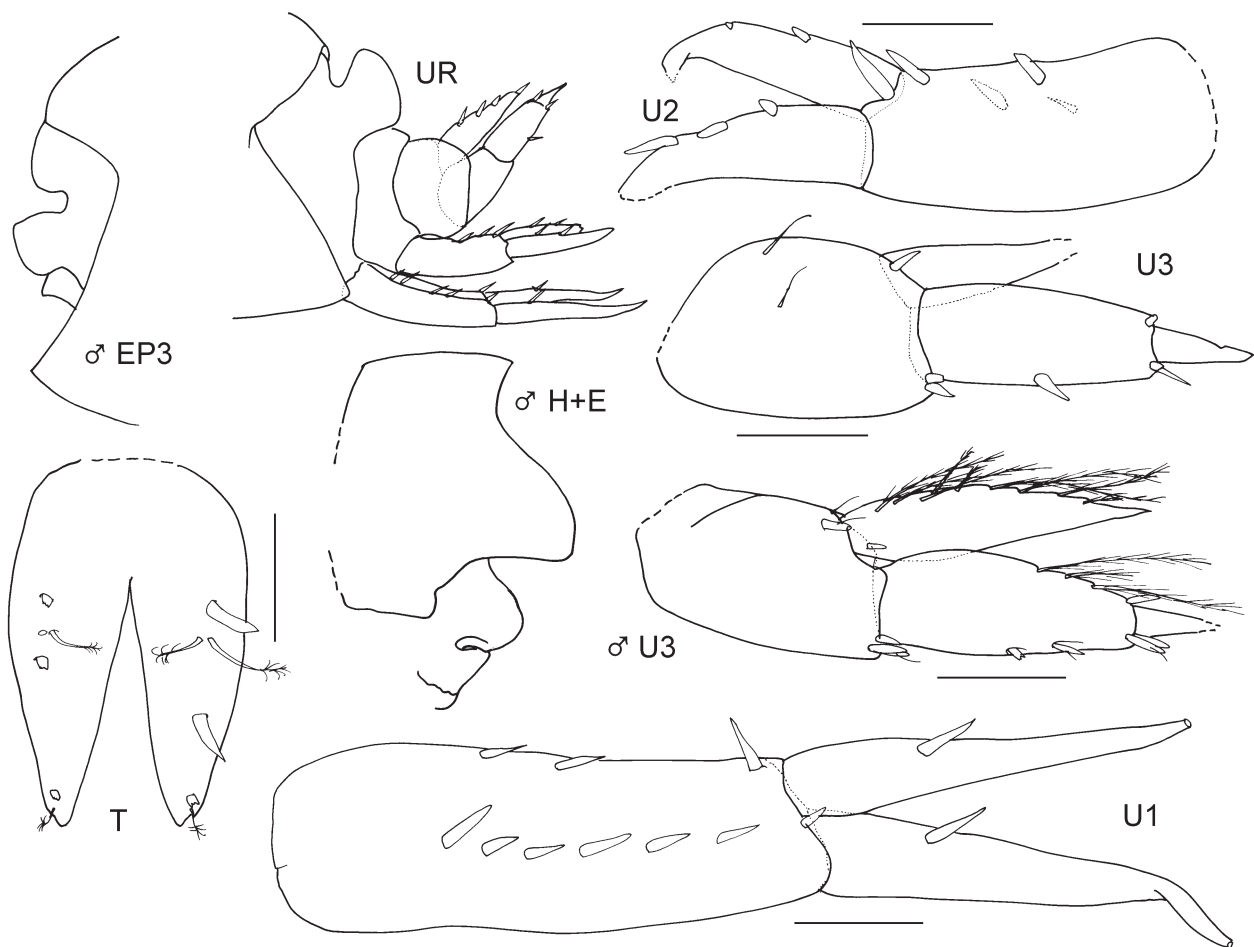


FIGURE 16. *Tryphosella camela* (Stebbing, 1910). Female, 4.0 mm, AM P.69404, east of Port Jackson, New South Wales; male, 4.4 mm, AM P.69405, east of Newcastle, New South Wales. *syntype female, AM P.2470, off Wattamolla, New South Wales. Scales represent 0.1 mm.

***Tryphosella chinchilla* sp. nov.**

(Figs 17–19)

Tryphosella sp. ?91. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, ovigerous (5 eggs), 5.0 mm, AM P.71611, east of Fitzroy Reef, Great Barrier Reef, Queensland, Australia, 23°32'53"S 152°16'44"E, 400 m, baited trap, 3–4 June 1994, J.K. Lowry & K. Dempsey, MV *Reefknot*, stn QLD-1105. PARATYPES: 1 male, 4.0 mm, AM P.71612; 1 female, ovigerous, 4.5 mm, AM P.71613; 723 specimens, AM P.52076; same data as Holotype. 240 specimens, AM P.52075, same data, stn QLD-1103; 368 specimens, same data, 2–3 June 1994, stn QLD-1085; 213 specimens, AM P.52072, same data, stn QLD-1087.

Additional material examined. *Queensland*: 1 specimen, AM P.49509, east of Flynn Reef, 16°40.14'S 146°20.03'E, 300 m, baited trap, 6–7 June 1993, J.K. Lowry, P. Freewater & W. Vader, RV *Sunbird*, stn QLD-924; 1 specimen, AM P.49516, same data, stn QLD-926; 1 specimen, AM P.50223, east of Flynn Reef, 16°39.92'S 146°20.71'E, 400 m, baited trap, 12.2°C, 6–7 June 1993, J.K. Lowry, P. Freewater & W. Vader, RV *Sunbird*, stn QLD-927; 1 specimen, AM P.50225, same data, stn QLD-928; 1 specimen, AM P.50285, same data, 7–8 June 1993, stn QLD-945; 6 specimens, AM P.50323, east of Flynn Reef, 16°40.14'S 146°20.03'E, 300 m, baited trap and sediment, 18–19 May 1994, J.K. Lowry & K. Dempsey, RV *Sunbird*, stn QLD-1040; 2 specimens, AM P.50329, same data, stn QLD-1042; 2 specimens, AM P.50334, east of Flynn Reef, 16°06.8'S 146°E, 600 m, baited trap, 6.8

°C, 18–19 May 1994, J.K. Lowry & K. Dempsey, RV *Sunbird*, stn QLD-1047; 1 specimen, AM P.49538, same data, stn QLD-1048; 1 specimen, AM P.49549, east of Flynn Reef, 16°39.00'S 146°21.79'E, 600 m, baited trap, 19–20 May 1994, J.K. Lowry & K. Dempsey, RV *Sunbird*, stn QLD-1068; 2 specimens, AM P.52021, east of Fitzroy Reef, 23°32.16'S 152°17.98'E, 203 m, baited trap, 17.8°C, 16–17 June 1993, J.K. Lowry, P. Freewater & R. Springthorpe, MV *Reefknot*, stn QLD-959; 36 specimens, AM P.52022 and 5 specimens, AM P.52646, east of Fitzroy Reef, 23°30.46'S 152°21.32'E, 300 m, baited trap, 15.4°C, 16–17 June 1993, J.K. Lowry, P. Freewater & R. Springthorpe, MV *Reefknot*, stn QLD-960; 37 specimens, AM P.52023, east of Fitzroy Reef, 23°30.46'S 152°21.32'E, 300 m, baited trap, 15.4°C, 16–17 June 1993, J.K. Lowry, P. Freewater & R. Springthorpe, MV *Reefknot*, stn QLD-961; 73 specimens, AM P.49457 and 7 specimens, AM P.52647, east of Fitzroy Reef, 23°26.17'S 152°28.46'E, 400 m, baited trap, 14.2°C, 16–17 June 1993, J.K. Lowry, P. Freewater & R. Springthorpe, MV *Reefknot*, stn QLD-963; 75 specimens, AM P.52024, same data, stn QLD-965; 443 specimens, AM P.52025 and 1 male, 4.0 mm, P.71614, east of Fitzroy Reef, 23°32'53"S 152°16'44"E, 300 m, baited trap, J.K. Lowry & K. Dempsey, MV *Reefknot*, 2–3 June 1994, stn QLD-1082; 363 specimens, AM P.52070, same data, stn QLD-1083; 67 specimens, AM P.52073, same data, 3–4 June 1994, stn QLD-1100; 103 specimens, AM P.52074, same data, stn QLD-1102.

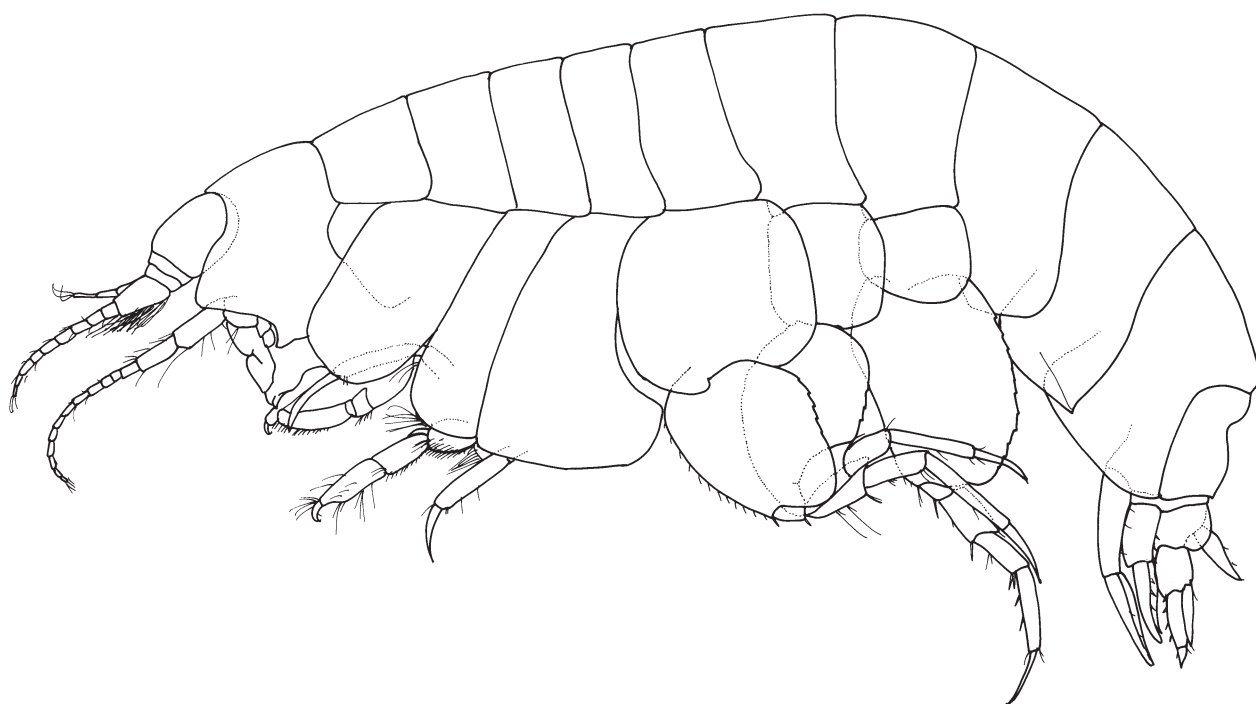


FIGURE 17. *Tryphosella chinchilla* sp. nov. Paratype female, 4.5 mm, AM P.71613, east of Fitzroy Reef, Queensland.

Type locality. East of Fitzroy Reef, Great Barrier Reef, Queensland, Australia, 23°32'53"S 152°16'44"E, 400 m depth.

Etymology. Named for the outback town of Chinchilla in central Queensland.

Diagnostic description. *Body* not expanded to form a lateral bulge, without dorsal carina. *Head* lateral cephalic lobe semidome, apically subacute; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field calynophore, robust setae present on proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced slightly beyond upper lip, broadly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 3 long apical robust setae.

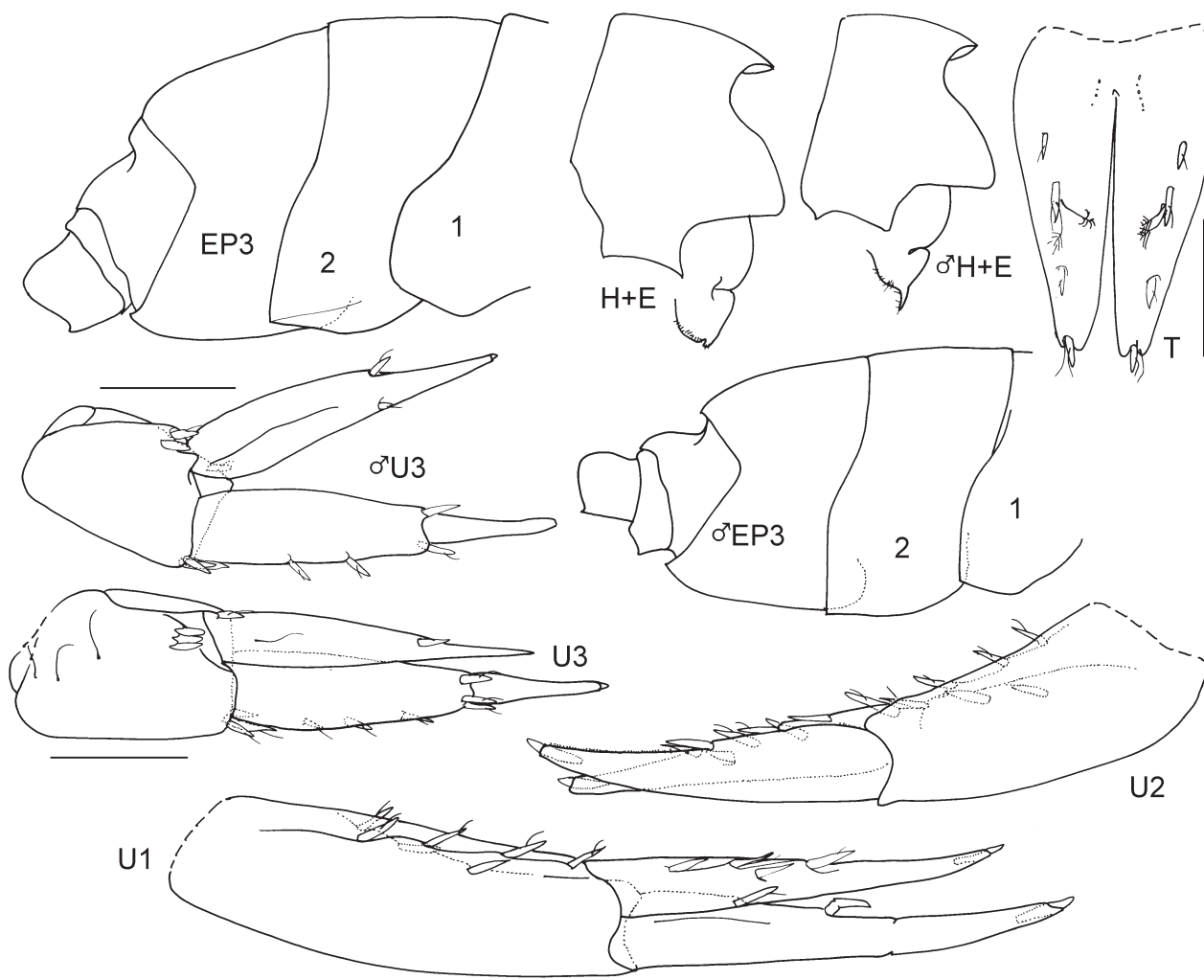


FIGURE 19. *Tryphosella chinchilla* **sp. nov.** Holotype, female, 5.0 mm, AM P.71611; paratype, male, 4.0 mm, AM P.71612; east of Fitzroy Reef, Queensland. Scales for G1, G2 represent 0.5 mm, remainder represent 0.1 mm.

Gnathopod 1 subchelate; **coxa medium length (length 1.6 x breadth), subtriangular, tapering distally; basis densely setose along anterior margin;** ischium short; carpus long, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm moderately acute, entire, straight. **Gnathopod 2** palm transverse. **Pereopod 4** coxa without distinct lateral ridge, with a well-developed posteroventral lobe. **Pereopod 5** coxa without distinct lateral ridge, without umbo; basis longer than broad, without photophore, not posteroproximally excavate, posterior margin weakly serrate. **Pereopod 7** basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. **Epimeron 3** posterior margin smooth, **posteroventral corner acutely produced.** **Urosomite 1** not projecting over urosomite 2, with anterodorsal notch and slightly rounded boss. **Uropods 1 and 2** outer rami without stout striated robust setae. **Uropod 2** inner ramus without constriction. **Uropod 3** peduncle without dorsolateral flange, with 3 short apicomedial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. **Telson** deeply cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). **Antenna 1** calceoli present, small. **Antenna 2** calceoli present.

Remarks. Only three Australasian species of *Tryphosella* (*T. chinchilla*, *T. cooeae* and *T. rodondo*) have a densely setose anterior margin on the basis of gnathopod 1. *Tryphosella chinchilla* and *T. cooeae* both differ from *T. rodondo* in having robust setae on the proximal articles of the flagellum of antenna 1. *Tryphosella chinchilla* is easily distinguished from *T. cooeae* by the broadly rounded epistome (acute in *T. cooeae*) and the 3 long slender apical setae on the maxilliped outer plate (2 in *T. cooeae*).

It is interesting to note that both *T. chinchilla* and *T. rodondo* have a dense covering of small fine setae on the surface and margins of the oostegites (in addition to the long lateral setae characteristic of lysianassoid oostegites). *Tryphosella cooeae* does not have these unusually setose oostegites.

Tryphosella chinchilla was most commonly taken in baited traps set at 300 to 400 m depth off the central Queensland coast (up to 725 specimens in a trap).

Distribution. Queensland, eastern Australia; 203–600 m depth.

***Tryphosella cooeae* sp. nov.**

(Figs 20–23)

Tryphosella sp. 146. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, ovigerous, 10.0 mm, AM P.69623, east of Fortescue Bay, Tasmania, Australia, 43°08.96'S 145°15.36'E, 1000 m, baited trap, 4.9°C, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-403. PARATYPES: 1 male, 8.5 mm, AM P.69624 and 12 specimens, AM P.51973, same data as Holotype; 10 specimens, AM P.51845, east of Fortescue Bay, Tasmania, 43°08.96'S 145°15.36'E, 1000 m, baited trap, 5.1°C, 16–17 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-365; 23 specimens, AM P.51846, same data, stn TAS-367; 21 specimens, AM P.51847, east of Fortescue Bay, Tasmania, Australia, 43°08.96'S 145°15.36'E, 1000 m, baited trap, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, 17–18 April 1993, stn TAS-383; 8 specimens, AM P.51848, same data, stn TAS-384; 2 specimens, AM P.51980, east of Fortescue Bay, Tasmania, Australia, 43°08.96'S 145°15.36'E, 1000 m, baited trap 1, 9–10 April 1994, J.K. Lowry & K. Dempsey on MV *Martrudan*, stn NSW-419; 1 specimen, AM P.51981, same data, stn TAS-421; 6 specimens, AM P.51982, east of Fortescue Bay, Tasmania, Australia, 43°08.96'S 145°15.36'E, 1000 m, baited trap, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-422; 15 specimens, AM P.57979, same data, stn TAS-423.

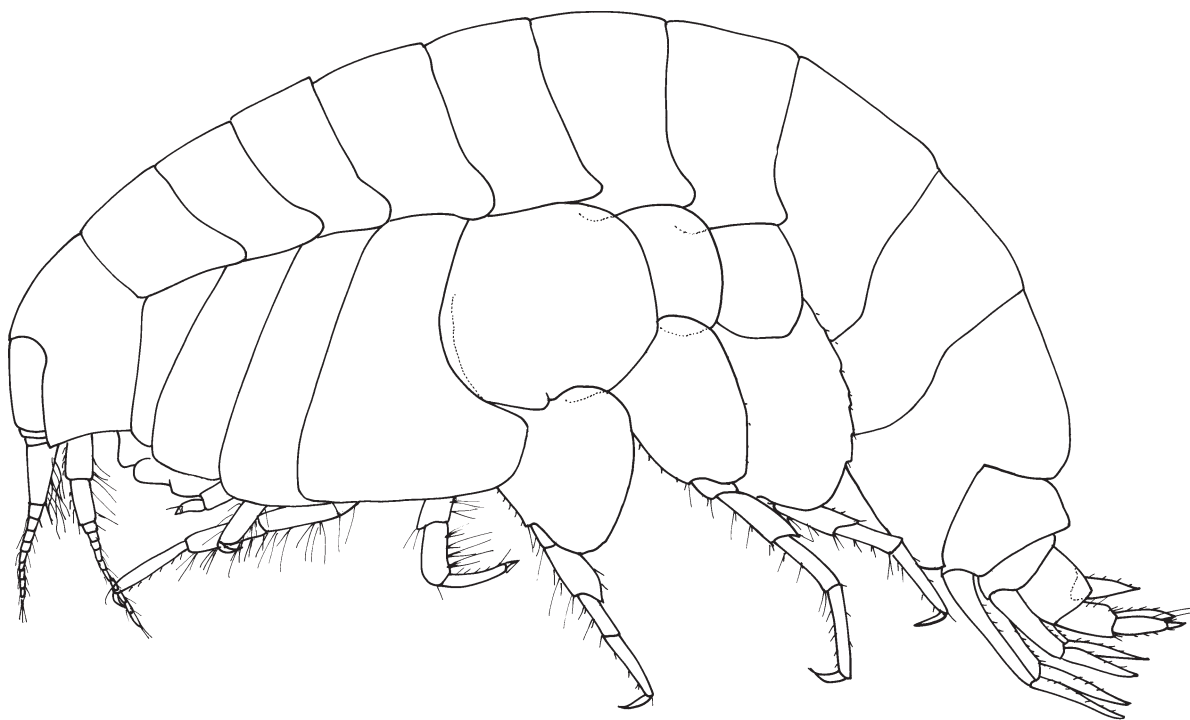


FIGURE 20. *Tryphosella cooeae* sp. nov. Holotype, female, 10.0 mm, AM P.69623, east of Fortescue Bay, Tasmania.

Additional material examined. *Tasmania*: 5 specimens, AM P.51849, east of Fortescue Bay, 43°07.36'S 145°13.75'E, 400 m, baited trap, 10.0°C, J.K. Lowry & K. Dempsey, MV *Martrudan*, 8–9 April 1994, stn TAS-398; 8 specimens, AM P.51971, same data, stn TAS-399; 13 specimens, AM P.51972, same data, stn TAS-400; 11 specimens, AM P.51974, same data, 9–10 April 1994, stn TAS-417; 22 specimens, AM P.51979, same data, stn

TAS-418; 22 specimens, AM P.76853 to AM P.76857, north of Hill U Seamount, Huon Study Area, 44°17'32"S 147°11'36"E, 1350 m, baited trap, 7 April 2007, S.J. Keable, RV *Southern Surveyor*; stn SS02/2007/57.

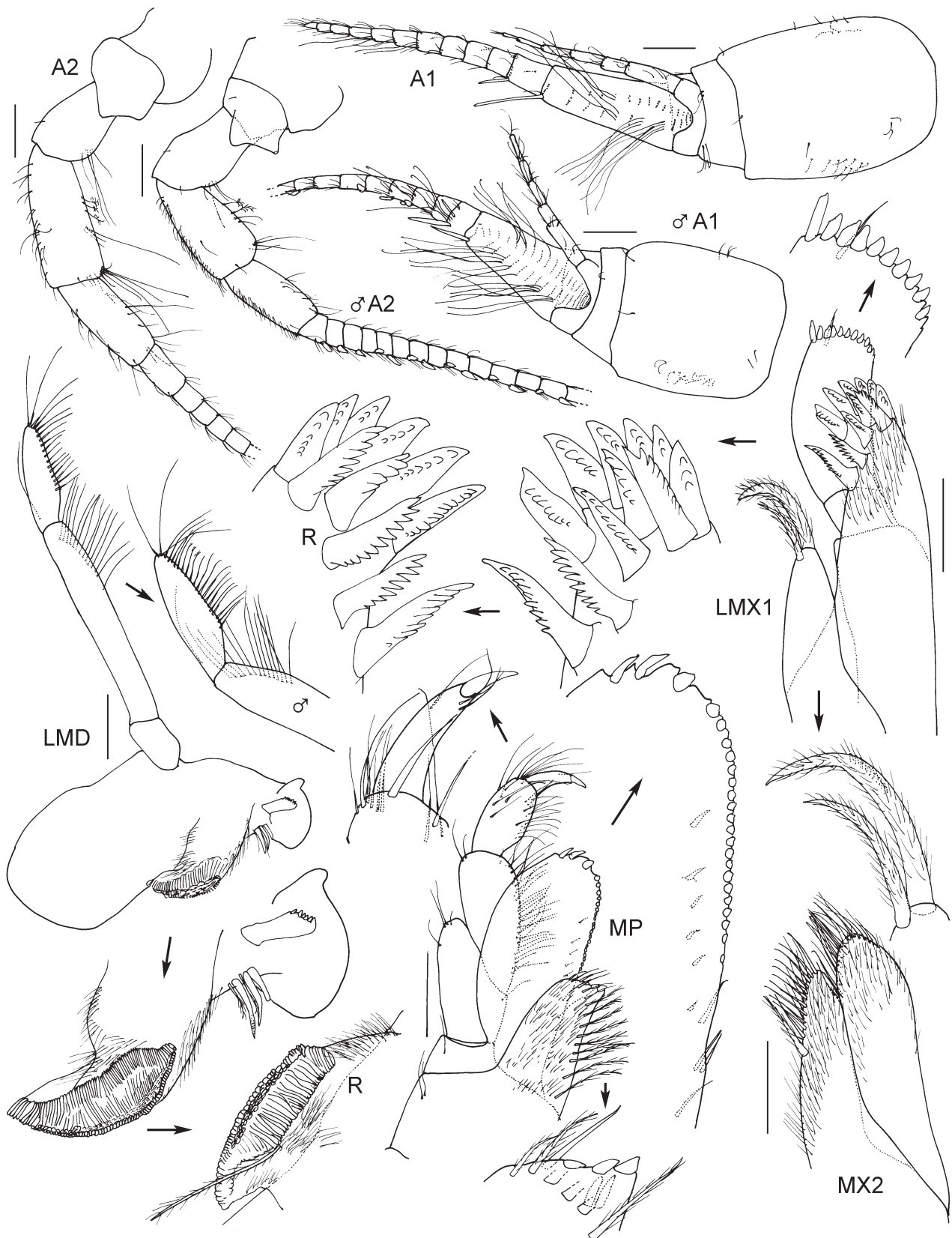


FIGURE 21. *Tryphosella cooeae* sp. nov. Holotype, female, 10.0 mm, AM P.69623; paratype, male, 8.5 mm, AM P.69624; east of Fortescue Bay, Tasmania. Scales represent 0.2 mm.

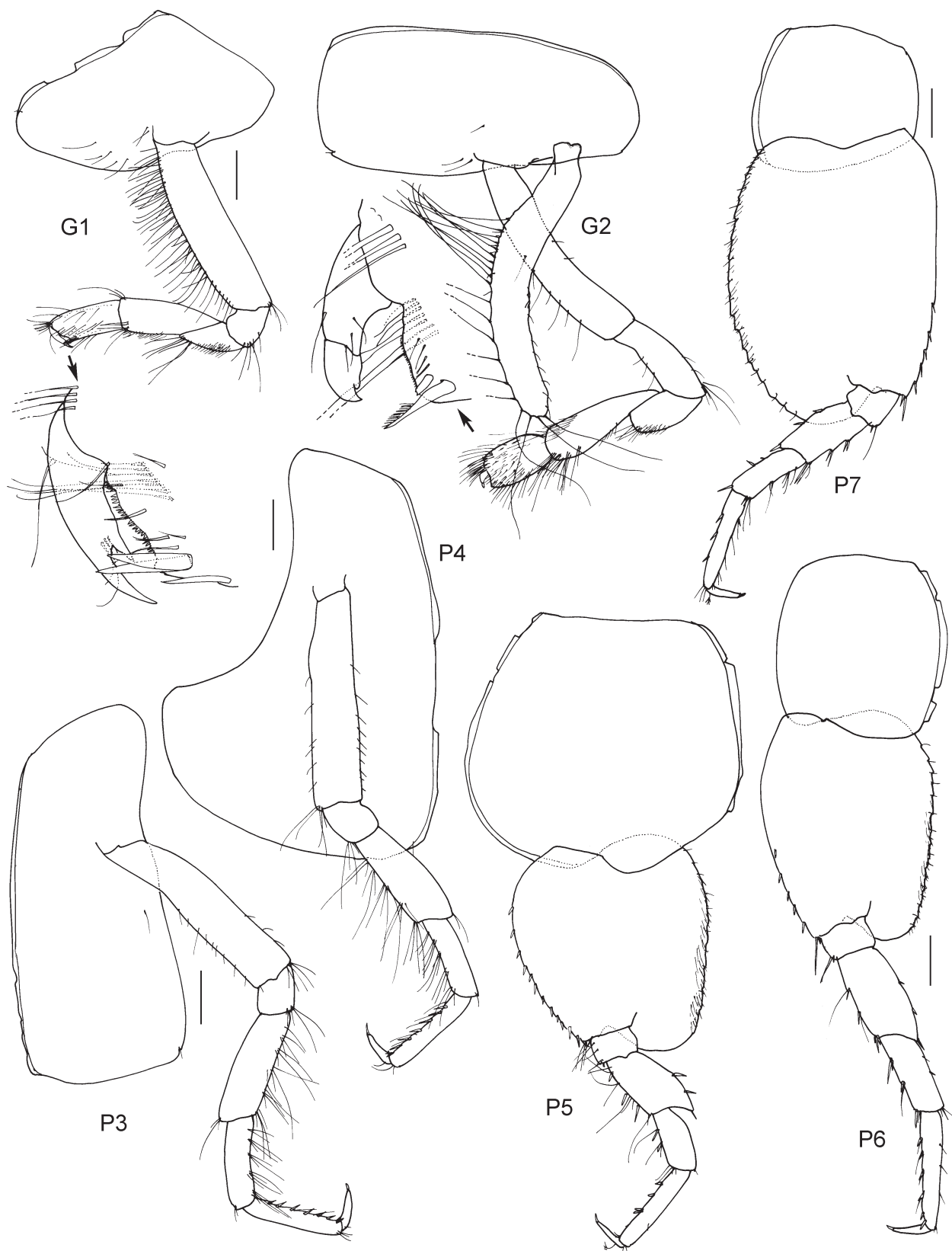


FIGURE 22. *Tryphosella cooei* **sp. nov.** Holotype, female, 10.0 mm, AM P.69623, east of Fortescue Bay, Tasmania. Scales represent 0.2 mm.

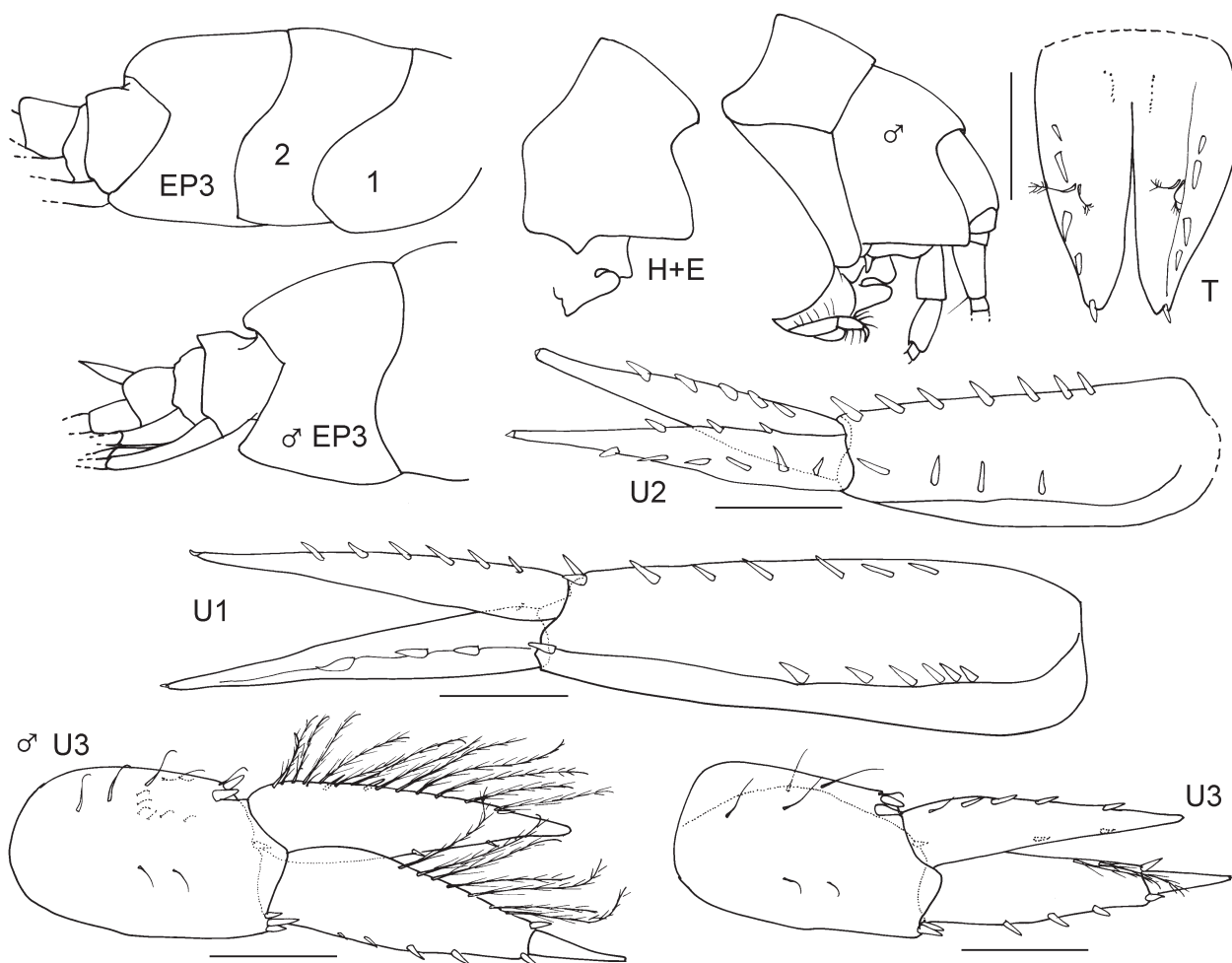


FIGURE 23. *Tryphosella cooeae* sp. nov. Holotype, female, 10.0 mm, AM P.69623; paratype, male, 8.5 mm, AM P.69624; east of Fortescue Bay, Tasmania. Scales represent 0.2 mm.

Type locality. East of Fortescue Bay, Tasmania, Australia, 43°08.96'S 145°15.36'E, 1000 m depth.

Etymology. Named for the north-coast town of Cooe, Tasmania.

Diagnostic description. *Head* lateral cephalic lobe a semidome, apically subacute; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field calynophore, robust setae present on proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, acute; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right symmetrical, left and right cuspidate along most of slightly sinusoidal inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 2 long apical robust setae.

Gnathopod 1 subchelate; coxa medium length (length 1.5 x breadth), subtriangular, tapering distally; basis densely setose along anterior margin; ischium short; carpus long, longer than propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm slightly acute, entire, straight. *Gnathopod 2* palm transverse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, without photophore, not posteroproximally excavate, posterior margin not serrate. *Pereopod 7* basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. *Epimeron 3* posterior margin smooth, posteroventral corner subacutely produced. *Urosomite 1* posterodorsally straight. *Uropods 1 and 2* outer rami

without stout striated robust setae. *Uropod* 2 inner ramus without constriction. *Uropod* 3 peduncle without dorso-lateral flange, with 2 short apicomedial robust setae; inner and outer rami well developed, outer ramus article 2 short, with 1 plumose seta on outer ramus. *Telson* deeply cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Antenna* 1 calceoli present, small. *Antenna* 2 flagellum long, calceoli present. *Epistome/Upper lip* epistome produced equally with upper lip, narrowly rounded. *Epimeron* 3 posteroventral corner narrowly rounded. *Urosomite* 1 with wedge-shaped boss, obliquely truncated apically. *Uropod* 3 with plumose setae on both rami.

Remarks. Within the Australasian area *T. cooeae* and *T. chinchilla* are the only species which have the combined characters of gnathopod 1 with a medium-sized coxa and a densely setose anterior margin on the basis. See under *T. chinchilla* for further Remarks.

Tryphosella cooeae was uncommon (1 to 23 specimens per trap) in baited traps from 400 and 1000 m depth off Tasmania.

Distribution. Victoria and Tasmania, southern Australia; 400–1840 m depth.

Tryphosella fortescue sp. nov.

(Figs 24–26)

Tryphosella sp. 183. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, ovigerous (6 eggs), 5.4 mm, AM P. 71619, east of Fortescue Bay, north of Hippolyte Rocks, Tasmania, Australia, 43°06.70'S 148°03.45'E, 100 m, baited trap, 9–10 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-408. PARATYPES: 1 male, 5.0 mm, AM P.71620; 1 male, 4.4 mm, AM P.71621; 296 specimens, AM P.52145; all with same data as Holotype.

Additional material examined. *New South Wales*: 10 specimens, AM P.69596, north of Toomere Head, Port Stephens, 32°42.7'S 152°11.2'E, 15 m, close to rocky shore, baited trap set 1000–1100 hrs, retrieved 0730–0830 hrs, 1–2 June 1988, J.K. Lowry & S.J. Keable, stn NSW-304; 28 specimens, AM P.47030, off Wollongong, 34°32.09'S 151°12.55'E, 200 m, baited trap, 13.7°C, 7–8 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-797; 1 specimen, AM P.47014, same data, stn NSW-798. *Tasmania*: 1 specimen, MV J11280, 25 km north-east of Deal Island, eastern Bass Strait, 39°14.8'S 147°31.5'E, 57 m, medium sand, Smith-McIntyre grab, 18 November 1981, RV *Tangaroa*, stn BSS 174G; 7 specimens, MV J62309, 100 km south-south-east of Cape Liptrap, central Bass Strait, 39°45.9'S 145°33.5'E, 74 m, muddy fine sand, epibenthic sled, 13 November 1981, R. Wilson, RV *Tangaroa*, stn BSS-156S; many specimens, AM P.69594, about 100 m west of Turners Rock and 80 m offshore, north side of Cape Sorell, 42°11.5'S 145°10.8'E, 13 m, baited trap, probably rocky bottom with sand patches, 27–28 April 1991, J.K. Lowry & S.J. Keable, stn TAS-301; 7 specimens, AM P.69595, 50 m off Weatherhead, Freycinet Peninsula, 42°14'S 148°15'E, 13 m, baited trap, 30 April–1 May 1991, J.K. Lowry & S.J. Keable, stn TAS-339; 1 specimen, AM P.45746, mouth of Fortescue Bay, 43°07.77'S 145°59.47'E, 50 m, baited trap, 16.2°C, 16–17 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-350; 2 specimens, AM P.52088, same data, 17–18 April 1993, stn TAS-370; 3 specimens, AM P.52090, same locality, 16.6°C, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-386; 1 specimen, AM P.52091, same data, stn TAS-387; 40 specimens, AM P.52095, same data, 9–10 April 1994, stn TAS-405; 1 specimen, AM P.52096, same data, stn TAS-406; 24 specimens, AM P.52087 and 3 specimens, AM P.57741, east of Fortescue Bay, north of Hippolyte Rocks, 43°06.70'S 148°03.45'E, 100 m, baited trap, 15.8°C, 16–17 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-354; 2 specimens, AM P.52089, same data, 17–18 April 1993, stn TAS-372; 23 specimens, AM P.52092, same locality, 15.6°C, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-389; 24 specimens, AM P.52093 and 1 specimen, AM P.71618, same data, stn TAS-390; 110 specimens, AM P.52094, same data, stn TAS-391; 6 specimens, AM P.52146, same data, 9–10 April 1994, stn TAS-409; 1 specimen, AM P.52147, same data, 200 m, stn TAS-410. *South Australia*: 11 specimens, SAM C6948, Wedge Island, 35°11.00'S 136°29.85'E, 10 m, baited trap set overnight, 22 March 2001, V. Martin, Waterhouse Club Expedition; 3 specimens, SAM C6947, Dangerous Reef, Spencer Gulf, approx. 34°49'S 136°12'E, dredged, K. Sheard; 6 females, 1 immature male, SAM C6949, North Cove, Pearson Island, 33°56.30'S 134°15.9'E, 25 m, baited trap set overnight, 17–18 March 2001, V. Martin, Waterhouse Club Expedition.

Type locality. East of Fortescue Bay, north of Hippolyte Rocks, Tasmania, Australia, 43°06.70'S 148°03.45'E, 100 m depth.

Etymology. The species is named for its type locality.

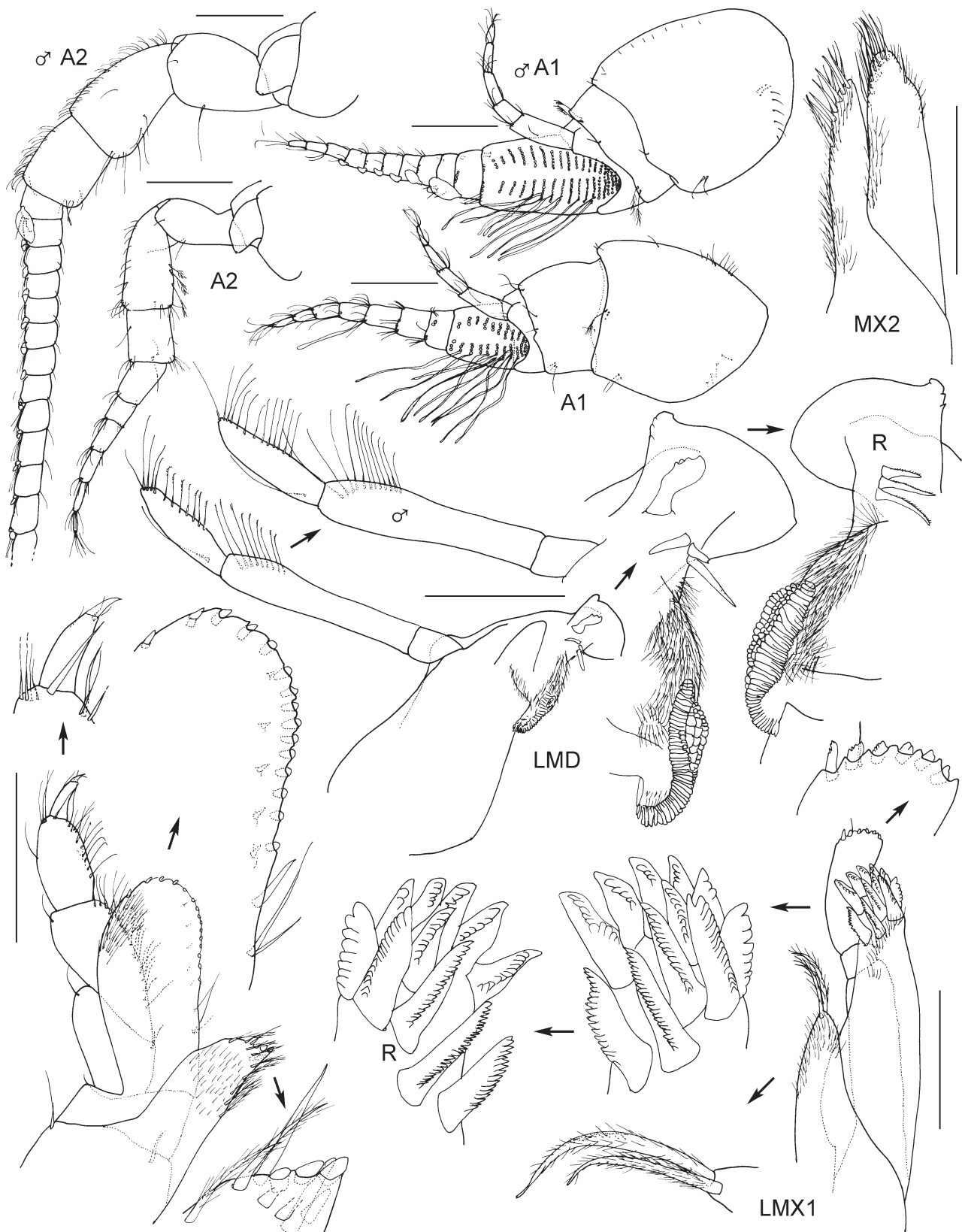


FIGURE 24. *Tryphosella fortescue* sp. nov. Holotype, female, 5.4 mm, AM P. 71619; paratype, male, 5.0 mm, AM P.71620; east of Fortescue Bay, Tasmania. Scales represent 0.2 mm.

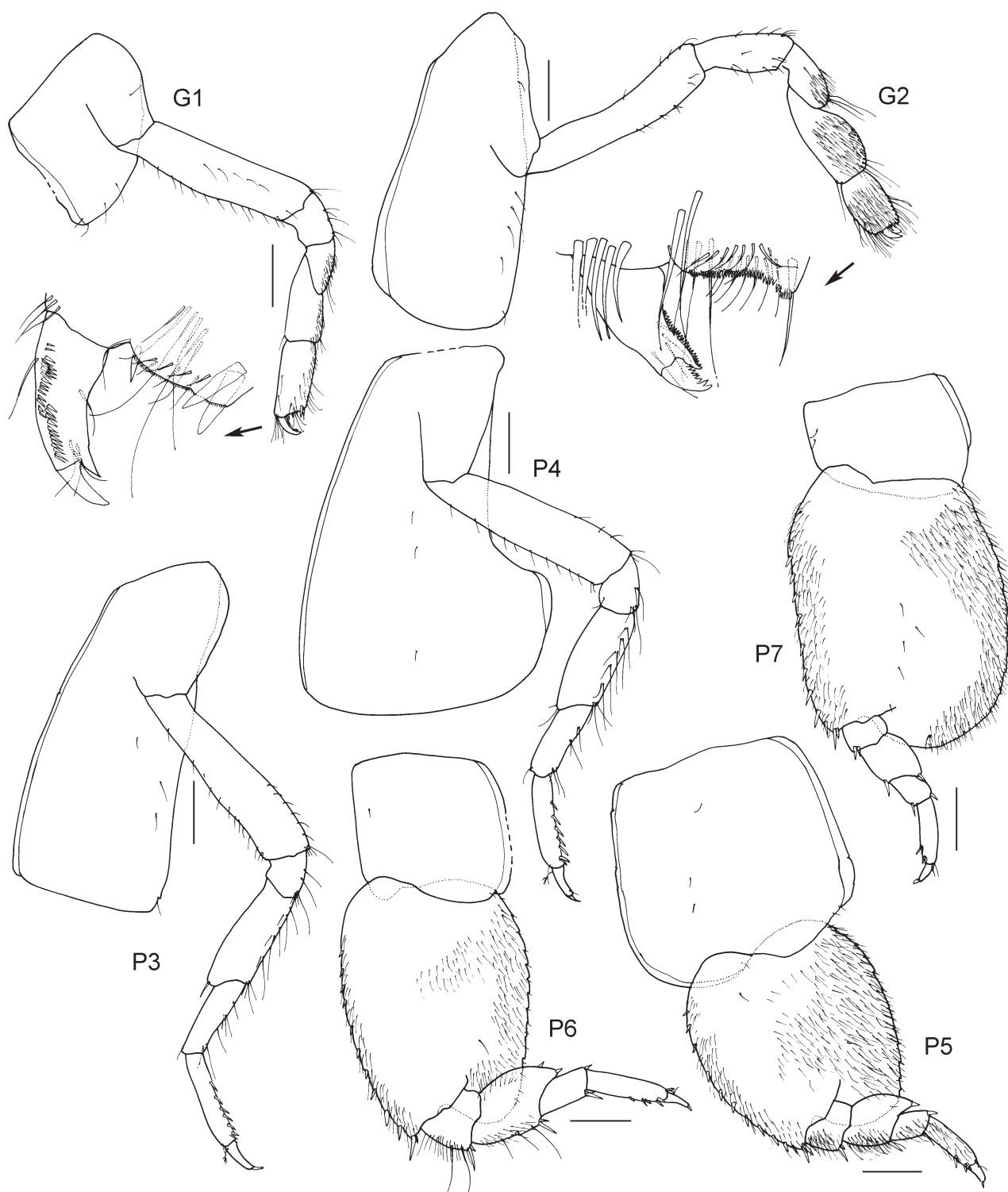


FIGURE 25. *Tryphosella fortescue* sp. nov. Holotype, female, 5.4 mm, AM P. 71619, east of Fortescue Bay, Tasmania. Scales represent 0.2 mm.

Diagnostic description. *Head* lateral cephalic lobe rounded, apically rounded; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field callynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome slightly produced beyond upper lip, broadly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally tritulating; palp

attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 1 short apicolateral robust seta and 3 short apical robust setae.

Gnathopod 1 subchelate; coxa small (length 1.1 x breadth), subtriangular, tapering distally; basis moderately setose along anterior margin; ischium short; carpus long, longer than propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm slightly acute, entire, straight. *Gnathopod 2* palm transverse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, without photophore, not posteroproximally excavate, posterior margin not serrate. *Pereopod 7* basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. ***Epimeron 3*** posterior margin smooth, posteroventral corner subacutely produced. ***Urosomite 1*** not projecting over urosomite 2, with deep notch and subtriangular, subacute boss. ***Uropods 1 and 2*** outer rami with distal stout striated robust setae. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange, with 2 short apicomedial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. *Telson* deeply cleft, with dorsal robust setae, with 2 apical robust setae on each lobe.

Male (sexually dimorphic characters). Head lateral cephalic lobe a semidome, apically subacute. *Antenna 1* calceoli present, proximal calceolus very large. *Antenna 2* flagellum long, calceoli present, proximal calceolus very large. *Epimeron 3* posteroventral corner narrowly rounded. *Urosomite 1* with wedge-shaped boss, obliquely truncated apically. *Uropod 3* with plumose setae on both rami.

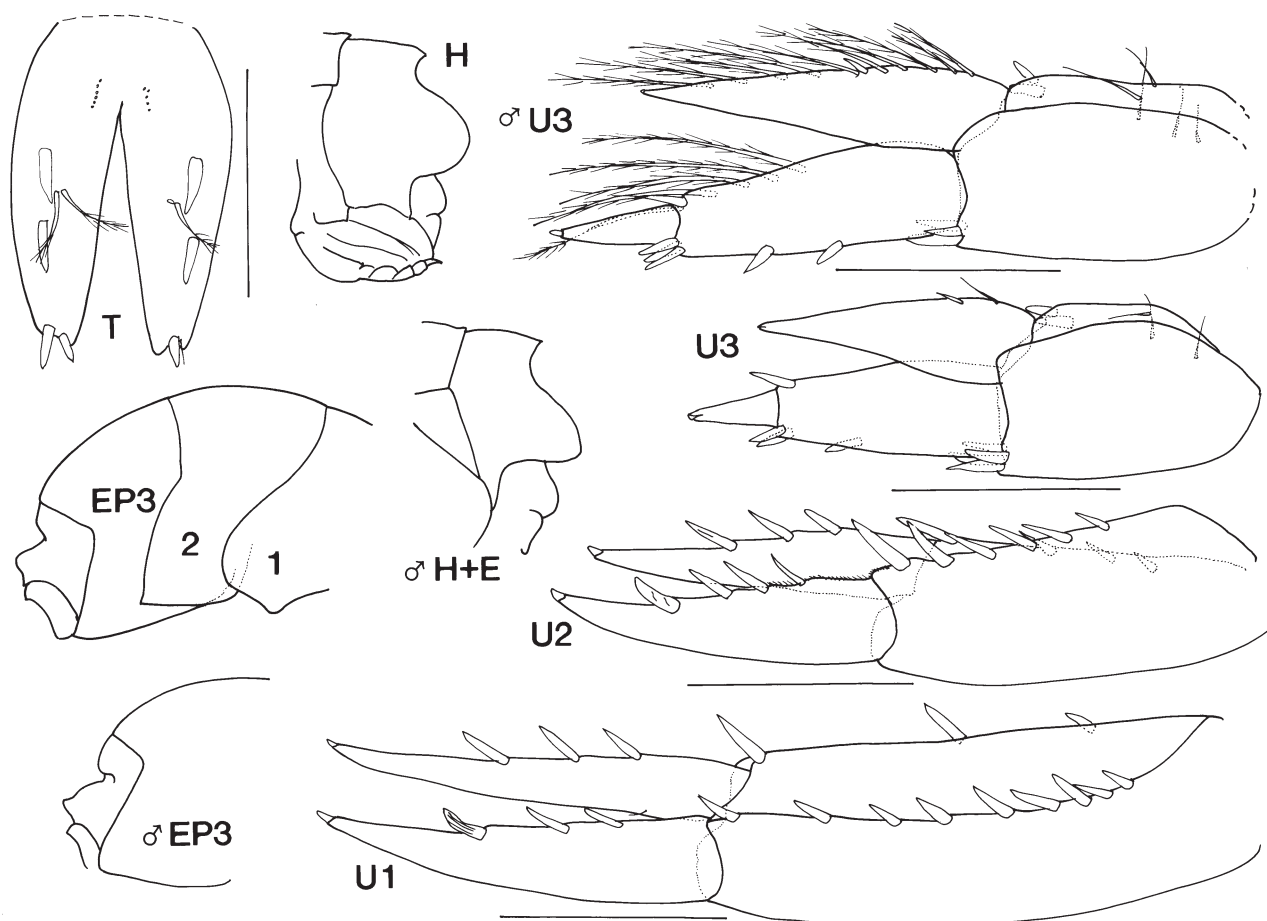


FIGURE 26. *Tryphosella fortescue* sp. nov. Holotype, female, 5.4 mm, AM P. 71619; paratype, male, 5.0 mm, AM P.71620; east of Fortescue Bay, Tasmania. Scales represent 0.2 mm.

Remarks. *Tryphosella fortescue* belongs to a group of Australian species (*T. fortescue*, *T. freycinet*, *T. orana*, *T. sorell*, *T. tathra* and *T. tuckanarra*) in which some or all of the robust setae on the outer ramus of uropods 1 and/or 2 are stouter than the others and have longitudinal striations. This group also share the characters of: no robust setae on antenna 1 flagellum, no long apical robust setae on the maxilliped outer plate, gnathopod 1 basis with a weakly setose anterior margin and a short ischium, urosomite 1 with some form of irregular or triangular boss and no plumose setae on uropod 3 of the females. They vary in: the shape of the lateral cephalic lobe, the number of apical robust setae on the maxilliped outer plate, the size of coxa 1, the angle of the gnathopod 2 palm, the shape of the boss on urosomite 1, the number of stout striated setae on uropods 1 and 2, the number of short apicomedial robust setae on the peduncle of uropod 3 and the number of apical robust setae on each lobe of the telson. It is interesting that all six species occur in southern Australia; none of the species from Queensland or nearby Papua New Guinea and New Caledonia have these unusual robust setae.

Of these six species all but *T. tuckanarra* have a significantly shortened subtriangular coxa 1 (about as long as broad). Only *T. fortescue* and *T. sorell* have a transverse palm on gnathopod 2. *Tryphosella fortescue* differs from *T. sorell* in having a subtriangular, subacute boss on urosomite 1 (rounded in *T. sorell*) and 2 short apicomedial robust setae on uropod 3 peduncle (1 in *T. sorell*).

Although *T. fortescue* occurred off the coast of New South Wales and South Australia it was captured most frequently off eastern Tasmania down to 200 m depth (up to 300 specimens in a trap).

Distribution. New South Wales, Tasmania and South Australia, eastern and southern Australia; 10–200 m depth.

***Tryphosella freycinet* sp. nov.**
(Figs 27–29)

Tryphosella sp. 188. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, ovigerous (4 eggs), 5.0 mm, AM P.69467, 50 m off Weatherhead, Freycinet Peninsula, Tasmania, Australia, 42°14'S 148°15'E, 13 m, baited trap, 30 April–1 May 1991, J.K. Lowry & S.J. Keable, RV *Flying Scud*, stn TAS-339. PARATYPES: 1 male, 4.5 mm, AM P.69468; 1 male, 4.0 mm, AM P.69469; 114 specimens, AM P.69470; all with same data as Holotype.

Additional material examined. *Tasmania*: 1 female, AM P.69466, about 100 m west of Turners Rock and 80 m offshore, north side of Cape Sorell, 42°11.5'S 145°10.8'E, 13 m, baited trap, probably rocky bottom with sand patches, 27–28 April 1991, J.K. Lowry & S.J. Keable, RV *Flying Scud*, stn TAS-301; 12 specimens, AM P.69471, off rocky point near eastern end of Bryans Beach, Freycinet Peninsula, 42°16'S 148°17.4'E, 12 m, baited trap, probably sandy bottom, 30 April–1 May 1991, J.K. Lowry & S.J. Keable, RV *Flying Scud*, stn TAS-338; 1 male, AM P.52148, mouth of Fortescue Bay, 43°07.77'S 145°59.47'E, 50 m, baited trap, 16.6°C, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-387

Type locality. 50 m off Weatherhead, Freycinet Peninsula, Tasmania, Australia, 42°14'S 148°15'E, 13 m depth.

Etymology. The species is named for its type locality.

Diagnostic description. *Head* lateral cephalic lobe a semidome, apically rounded; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field calynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, narrowly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 1 short apicolateral robust seta and 3 short apical robust setae.

Gnathopod 1 subchelate; **coxa small (length 1.2 x breadth), subtriangular, tapering distally**; basis sparsely setose along anterior margin; ischium short; carpus long, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, **palm transverse**, entire, straight. *Gnathopod 2* palm moderately obtuse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed pos-

teroverventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, not posteroproximally excavate, posterior margin not serrate. *Pereopod 7* basis posterodistally produced less than half-way along merus, not posterodistally excavate.

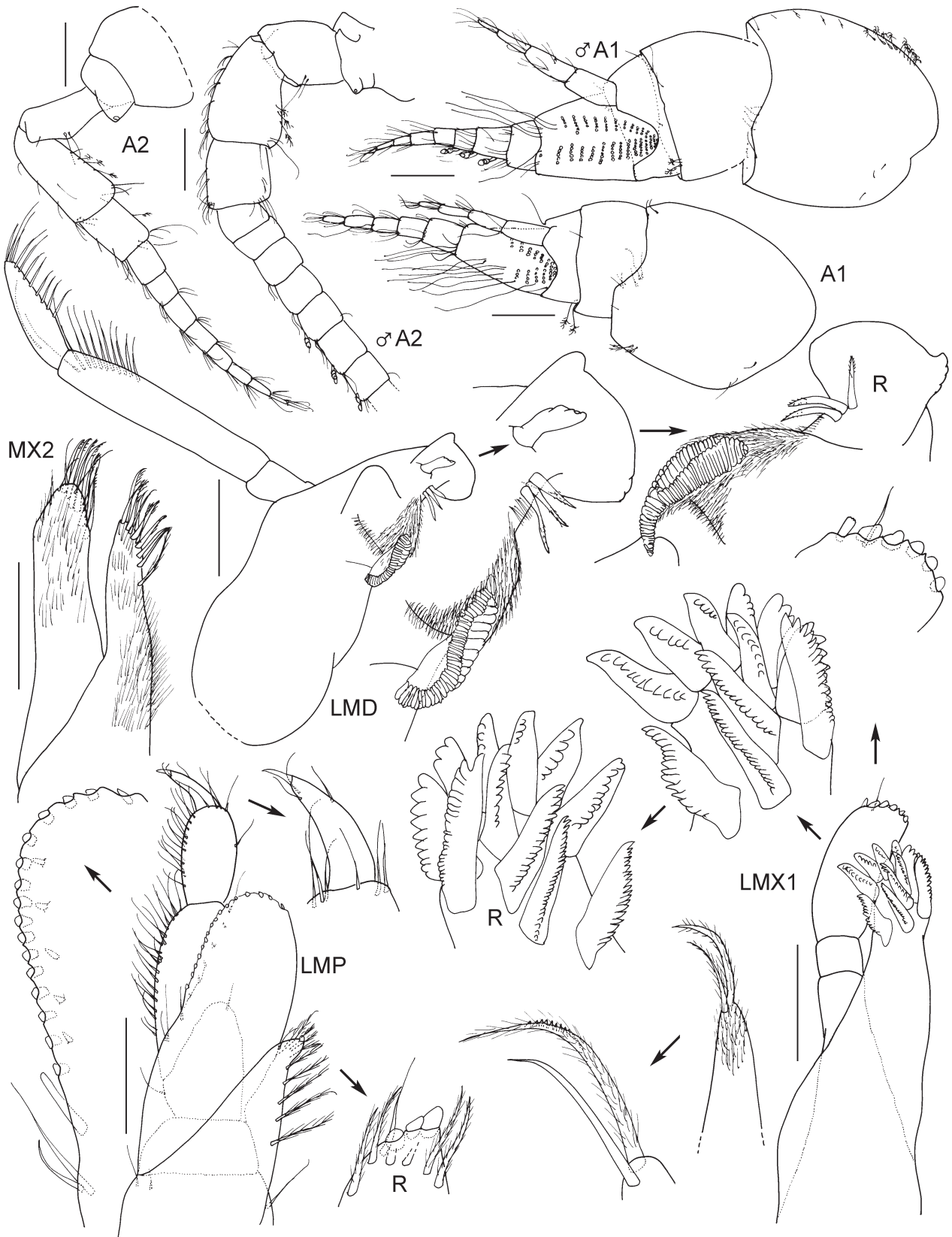


FIGURE 27. *Tryphosella freycinet* sp. nov. Holotype, female, 5.0 mm, AM P.69467; paratype, male, 4.5 mm, AM P.69468; Freycinet Peninsula, Tasmania. Scales represent 0.1 mm.

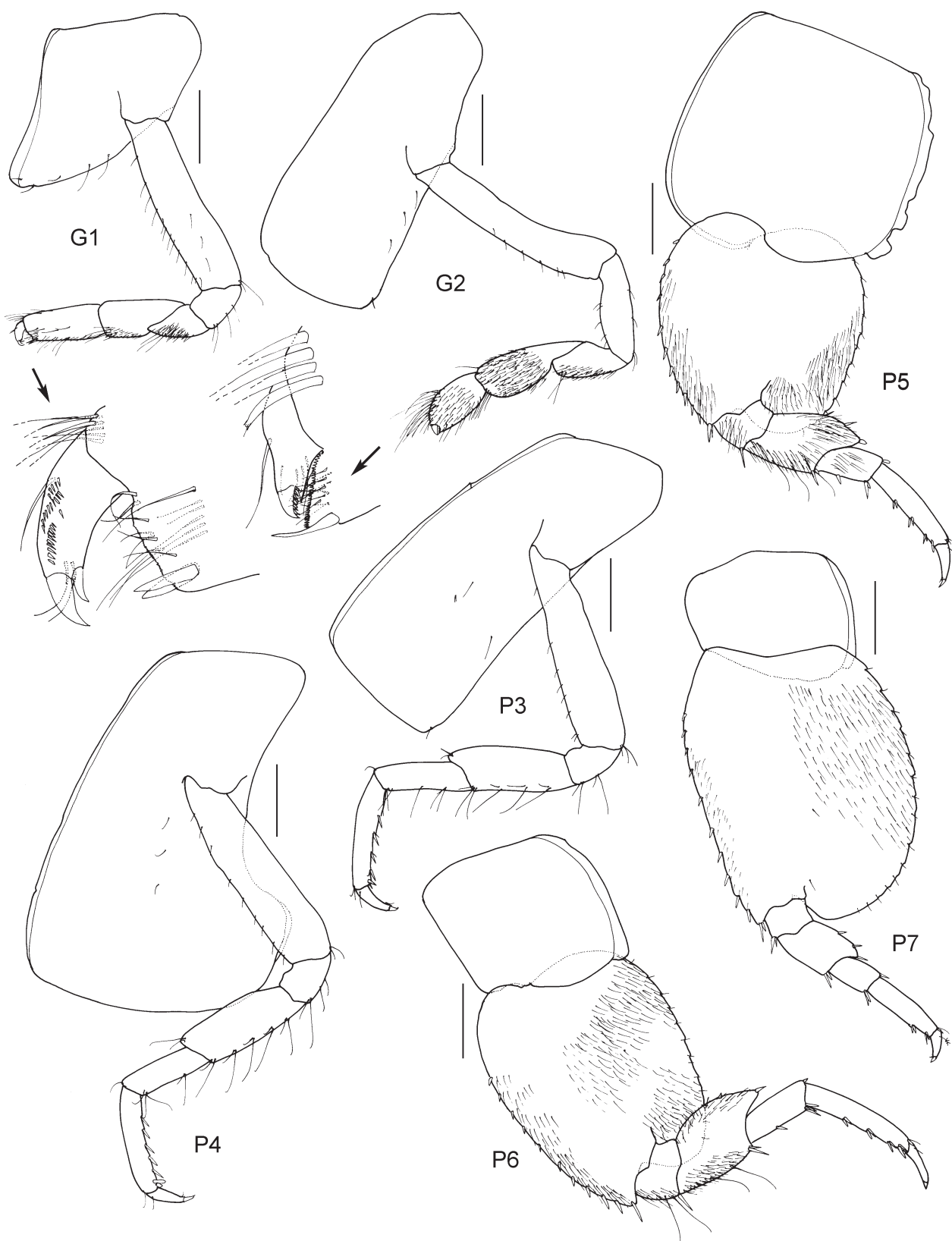


FIGURE 28. *Tryphosella freycinet* **sp. nov.** Holotype, female, 5.0 mm, AM P.69467, Freycinet Peninsula, Tasmania. Scales represent 0.2 mm.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. *Epimeron 3* posterior margin smooth, posteroventral corner narrowly rounded. *Urosomite 1* not projecting over urosomite 2, **with wedge-shaped boss**,

obliquely truncated apically. *Uropods 1 and 2* outer rami with all robust setae stout and striated. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange, with 1 short apicomedial robust seta; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. *Telson* deeply cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Head* lateral cephalic lobe rounded. *Antenna 1* calceoli present, small. *Antenna 2* flagellum long, calceoli present. *Epimeron 3* posteroventral corner subquadrate. *Urosomite 1* with deep notch and subtriangular, subacute boss. *Uropod 3* with few plumose setae on each ramus.

Remarks. *Tryphosella freycinet* is one of the group of six Australian species with stout striated robust setae on the outer rami of uropods 1 and 2 (see Remarks under *T. fortescue*). Only two species, *T. freycinet* and *T. sorell*, have all of the robust setae in this form. *Tryphosella freycinet* differs from *T. sorell* in having an obtuse palm on gnathopod 2 (transverse in *T. sorell*), urosomite 1 with a wedge-shaped boss, obliquely truncated apically (rounded in *T. sorell*) and only one apical robust seta on each lobe of the telson (two in *T. sorell*).

Tryphosella freycinet was uncommon (up to 117 specimens per trap) in baited traps set at 12 to 13 m depth off the east coast of Tasmania.

Distribution. Tasmania, southern Australia; 12–50 m depth.

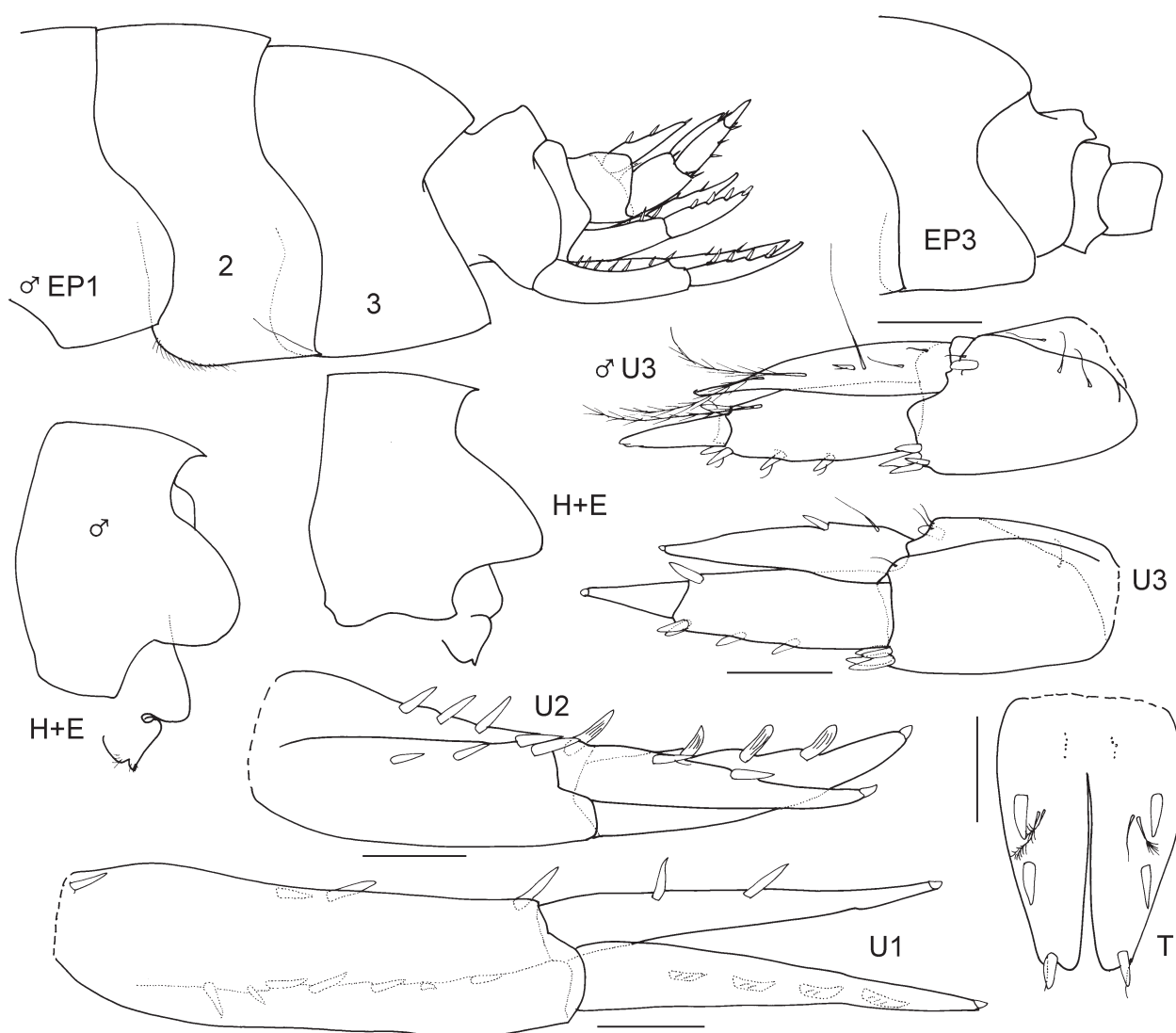


FIGURE 29. *Tryphosella freycinet* sp. nov. Holotype, female, 5.0 mm, AM P.69467; paratype, male, 4.5 mm, AM P.69468; Freycinet Peninsula, Tasmania. Scales represent 0.1 mm.

***Tryphosella martrudan* sp. nov.**

(Figs 30–32)

Tryphosella sp. 486. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, ovigerous (2 eggs), 4.0 mm, AM P.69438, mouth of Fortescue Bay, Tasmania, Australia, 43°07.77'S 145°59.47'E, 50 m, baited trap, 9–10 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-405. PARATYPES: 1 male, 3.5 mm, AM P.69441 and 5 specimens, AM P.52237, same data as Holotype; 2 specimens, AM P.52238, same data, stn TAS-406; 2 specimens, AM P.52236, same data, 8–9 April 1994, stn TAS-387; 1 specimen, AM P.52235, same data, 17–18 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-370.

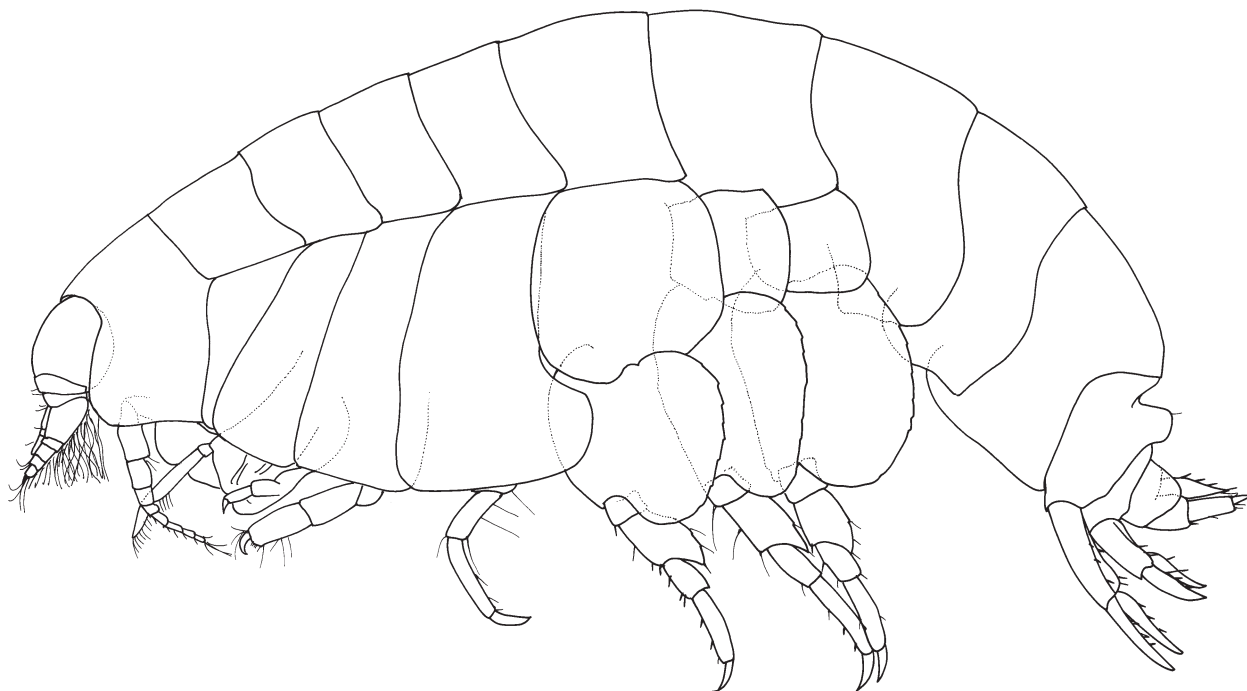


FIGURE 30. *Tryphosella martrudan* sp. nov. Female, 3.5 mm, P.69414, east of Coffs Harbour, New South Wales.

Additional material examined. *Queensland*: 1 specimen, AM P.48011, due east of Mooloolaba, 26°39.13'S 153°18.88'E, 51 m, baited trap, 19.9°C, 2–3 August 1994, J.K. Lowry & K. Dempsey, MV *Capricorn I*, stn QLD-1123; 1 specimen, AM P.47914, same data, 3–4 August 1994, stn QLD-1142; 1 specimen, AM P.57728, same locality, 50 m, baited trap, 20°C, 2–3 July 1995, J.K. Lowry & K. Dempsey, MV *Capricorn I*, stn QLD-1195. *New South Wales*: female, ovigerous (3 eggs), 4.0 mm, AM P. 69409, 1 male, 3.5 mm, AM P.69410, 1 male, 2.5 mm, AM P.69411, 2 immatures, 2.2 and 2.3 mm, AM P.69412 and P.69413, 1 ovigerous female, 3.5 mm, P.69414, 64 specimens, AM P.52234, due east of Coffs Harbour, New South Wales, Australia, 30°17.49'S 153°13.90'E, 45.4 m, baited trap, 11–12 August 1993, P. Berents, R.T. Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-875; 5 specimens, AM P.48400, off Wollongong, 34°26.42'S 150°58.04'E, 50 m, baited trap, 19.5°C, 7–8 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-792; 2 specimens, AM P.48229, same data, stn NSW-793; 1 specimen, AM P.69440, south-west of Montagu Roadstead, Jervis Bay, 35°02.26'S 150°45.06'E, 22 m, baited trap, 11–16 May 1993, C. Alvars; 1 specimen, AM P.69415, north-east of Hyams Beach, Jervis Bay, 35°05.58'S 150°44.32'E, 23 m, baited trap, 11–16 May 1993, C. Alvars; 2 specimens, AM P.69419, north-east of Hyams Beach, Jervis Bay, 35°05.45 'S 150°43.59'E, 22–23 m, baited trap, 11–16 May 1993, C. Alvars; 2 specimens, AM P.69439, north-east of Hyams Beach, Jervis Bay, 35°05.45'S 150°42.00'E, baited trap, 11–16 May 1993, C. Alvars; 1 specimen, AM P.69417, south-west of Longnose Point, Jervis Bay, 35°05.13'S 150°45.37'E, 27 m, baited trap, 11–16 May 1993, C. Alvars; 1 specimen, AM P.69418, north of Bowen Island, Jervis Bay, 35°06.18'S 150°46.17'E, 33 m, baited trap, 11–16 May 1993, C. Alvars, stn 18D; 1 specimen, AM P.69416, east of Bowen Island, Jervis

Bay, 35°07.08'S 150°46.37'E, 39 m, baited trap, 11–6 May 1993, C. Alvares, stn 8D; 2 females, AM P.69401 and 2 specimens, AM P.69442, off mouth of Moona Moona Creek, Jervis Bay, NSW, 35°03.5'S 150°41'E, 8 m, air-lifted sediment, P.B. Berents, 29 January 1983, stn NSW-263.

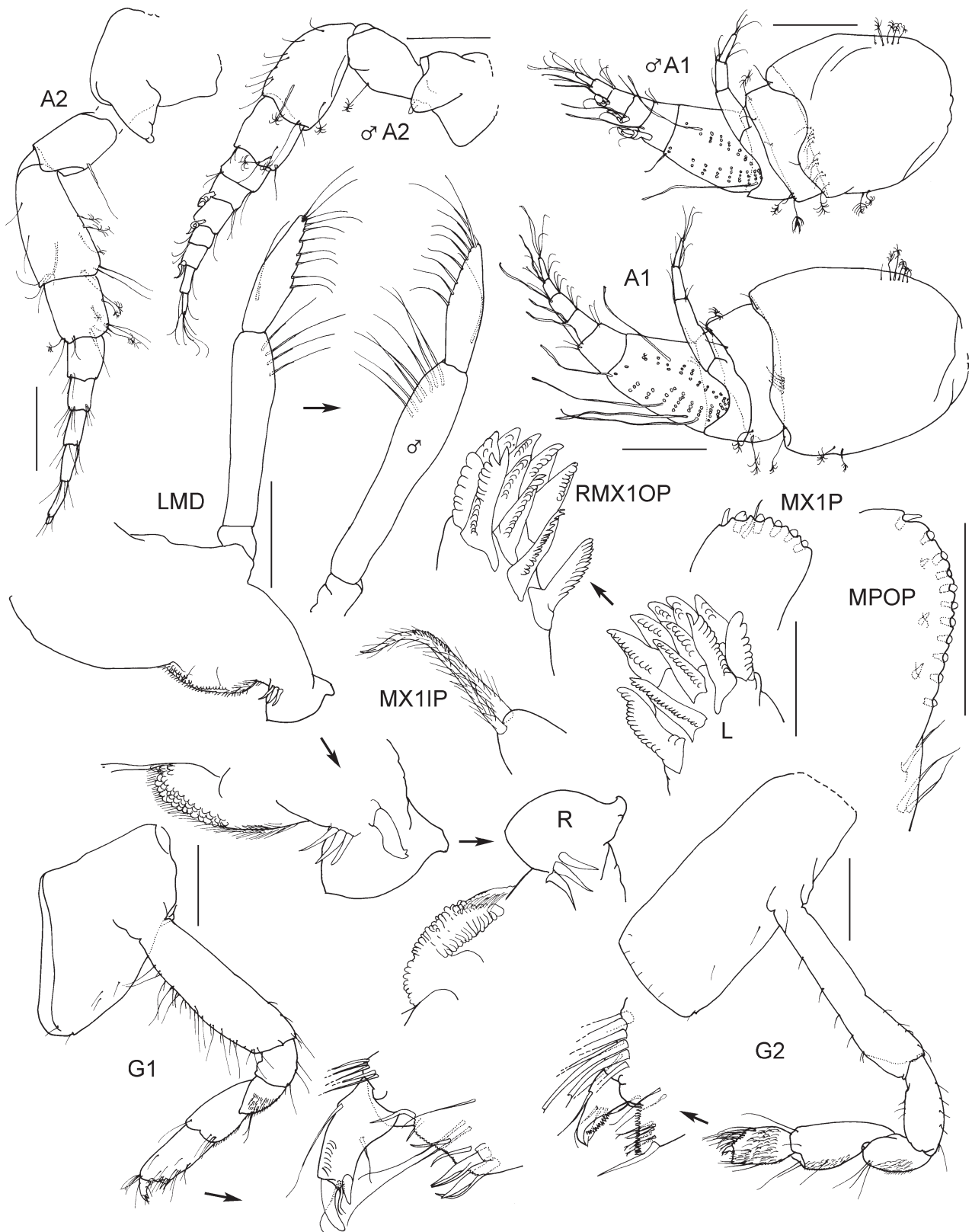


FIGURE 31. *Tryphosella martrudan* sp. nov. Holotype, female, 4.0 mm, AM P.69438; paratype, male, 3.5 mm, AM P.69441; Fortescue Bay, Tasmania. Scale for MX1 represents 0.05 mm, scales for G1, G2 represent 0.2 mm, remainder represent 0.1 mm.

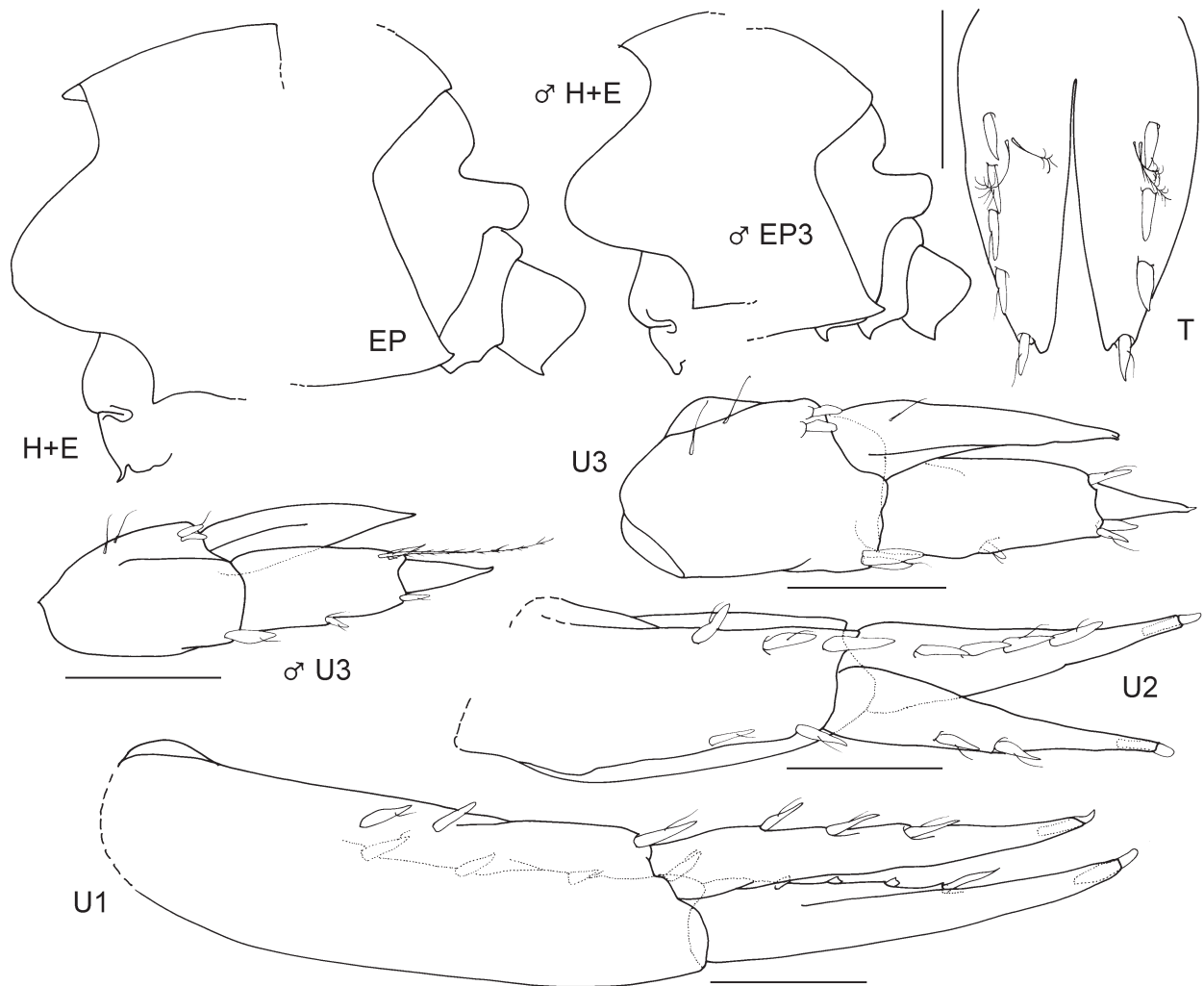


FIGURE 32. *Tryphosella martrudan* **sp. nov.** Holotype, female, 4.0 mm, AM P.69438; paratype, male, 3.5 mm, AM P.69441; Fortescue Bay, Tasmania. Scales represent 0.1 mm.

Type locality. Mouth of Fortescue Bay, Tasmania, Australia, 43°07.77'S 145°59.47'E, 50 m depth.

Etymology. The species is named for handsome cray fishing vessel, MV *Martrudan* from which the traps were set that caught the type material.

Diagnostic description. *Head* lateral cephalic lobe rounded, apically rounded; eyes apparently absent. *Antenna 1* peduncular article 1 without anterodistal lobe; article 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field callynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, broadly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* setal-tooth 7 left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 1 short apical robust seta.

Gnathopod 1 subchelate; coxa small (length 1.3 x breadth), subtriangular, tapering distally; basis moderately setose along anterior margin; ischium short; carpus long, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm slightly acute, entire, straight. *Gnathopod 2* propodus palm moderately obtuse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as

long as broad, without photophore, not posteroproximally excavate, posterior margin weakly or not serrate, without posteroventral lobe or spine. *Pereopod 7* basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. ***Epimeron 3*** posterior margin smooth, **posteroventral corner acutely produced**. *Urosomite 1* not projecting over urosomite 2, with a posteriorly-directed elongate rounded boss. *Uropods 1 and 2* outer rami without stout striated robust setae. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange, with 2 short apicomедial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. ***Telson* deeply cleft**, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Head* lateral cephalic lobe subtriangular. *Antenna 1* calceoli present, small. *Antenna 2* calceoli present. ***Gnathopod 1* simple**; propodus margins tapering distally, palm absent. *Uropod 3* with 1 plumose seta on outer ramus.

Remarks. *Tryphosella martrudan* belongs to a group of four Australian species (*T. betka*, *T. martrudan*, *T. too-woomba* and *T. wangaratta*) in which the male gnathopod 1 is simple. Within this group *T. martrudan* is most similar to *T. betka* (see Remarks there-under).

Tryphosella martrudan was uncommon (one catch of 70 specimens but usually less than 10 specimens) in baited traps set in shallow water (20 to 50 m depth) from southern Queensland to Tasmania.

Distribution. Queensland to Tasmania, eastern Australia; 8–51 m depth.

***Tryphosella orana* J.L. Barnard, 1972**

Tryphosella orana J.L. Barnard, 1972: 276, figs 164, 165. —Jones, 1986: 14. —Sergeev *et al.*, 1988: 102 (table 1). —Barnard & Karaman, 1991: 537. —Lowry & Stoddart, 2003: 171.

Type locality. Middleton Beach, Albany, Western Australia, [approx. 35°00'S 117°52'E], intertidal.

Material examined. *Western Australia*: 9 specimens, AM P.70530, Vancouver Peninsular, near Mistaken Island, King George Sound, 35°04'S 117°56'E, 6 m, sea grass with bryozoan or fine pink alga, 13 December 1983, R.T. Springthorpe, stn WA-120; 1 male, AM P.70531, off Possession Point, King George Sound, 35°02.5'S 117°55'E, 10 m, sand and detritus from bases of sea grass, 14 December 1983, R.T. Springthorpe & J.K. Lowry, stn WA-131; 2 ovigerous females, AM P.70532, 2 km south-east of South Point, Two Peoples Bay, 34°58'S 118°12'E, 14 m, *Caulerpa* bases and sand from fine sand bottom, 16 December 1983, J.K. Lowry, stn WA-178.

Diagnostic description. *Head* lateral cephalic lobe rounded, apically rounded; eyes lageniform (but fading in alcohol). *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field calynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, broadly rounded; upper lip slightly produced, rounded apically. *Mandible* molar with asymmetrically reduced column, proximally setose, distally tritulating; article 3 with proximal A3-seta; palp distal margin with apical robust setae. *Maxilliped* outer plate with 2 short apical robust setae.

Gnathopod 1 subchelate; **coxa small (length 1.1 x breadth), subtriangular, tapering distally; basis sparsely setose along anterior margin**; ischium short; carpus long, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, palm slightly acute, entire, straight. ***Gnathopod 2* propodus palm slightly obtuse**. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, not posteroproximally excavate, posterior margin weakly serrate. *Pereopod 7* basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. ***Epimeron 3*** posterior margin smooth, **posteroventral corner narrowly rounded**. *Urosomite 1* not projecting over urosomite 2, with anterodorsal notch and slightly rounded boss. ***Uropods 1 and 2* outer rami with distal stout striated robust setae**. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange, with 2 short apicomедial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. *Telson* deeply cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Head* lateral cephalic lobe a semidome. *Antenna 1* calceoli small. *Antenna 2* peduncular articles 4 and 5 enlarged; flagellum long, calceoli present. *Urosomite 1* with anterodorsal notch and rounded boss. *Uropod 3* with 1 short apicomedial robust seta; with plumose setae on both rami.

Remarks. *Tryphosella orana* is one of the group of six Australian species with stout striated robust setae on the outer rami of uropods 1 and 2 (see Remarks under *T. fortescue*). *Tryphosella orana* is most similar to *T. tathra* – see Remarks under that species.

Distribution. Southern Western Australia, intertidal to 14 m depth.

***Tryphosella rodondo* sp. nov.**

(Figs 33–36)

Tryphosella sp. 91. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, with setose oostegites, 5.0 mm, MV J62300, 66 km south of Rodondo Island, Victoria, central Bass Strait, Australia, 39°48.6'S 146°18.8'E, 82 m, sand, silt and mud, epibenthic sled, 13 November 1981, R. Wilson, RV *Tangaroa*, stn BSS-158S. PARATYPES: 1 female, 5.0 mm, AM P.85307, same data as Holotype; 7 specimens, P.45777, east of Fortescue Bay, north of Hippolyte Rocks, Tasmania, Australia, 43°06.70'S 148°03.45'E, 100 m, baited trap, 15.8°C, 16–17 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-353; 20 specimens, AM P.50280, 1 ovigerous female, 5.5 mm, AM P.71624, 1 immature female, 4.0 mm, AM P.71625, 1 mature male, 5.0 mm, AM P.71625 and 1 immature male, 4.2 mm, AM P.71626, same data, stn TAS-354; 200 specimens, AM P.51834 and 45 specimens, MV J62310, same data, 17–18 April 1993, stn TAS-371; 11 specimens, AM P.51835, east of Fortescue Bay, north of Hippolyte Rocks, Tasmania, 43°06.70'S 148°03.45'E, 100 m, baited trap, 15.6°C, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-389; 1 specimen, AM P.51836, same data, stn TAS-390; 39 specimens, AM P.51837, same data, stn TAS-391; 38 specimens, AM P.51842, same data, 9–10 April 1994, stn TAS-408; 4 specimens, AM P.51319, same data, stn TAS-409.

Additional material examined. *Tasmania*: 2 specimens, AM P.51838, east of Fortescue Bay, 43°06.70'S 145°13.6'E, 200 m, baited trap, 13.2°C, J.K. Lowry & K. Dempsey, MV *Martrudan*, 8–9 April 1994, stn TAS-392; 13 specimens, AM P.51833, east of Fortescue Bay, 43°09.37'S 145°13.6'E, 300 m, baited trap, 14.2°C, 16–17 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-359; 2 specimens, AM P.51839, east of Fortescue Bay, 43°09.37'S 145°13.6'E, 300 m, baited trap, 11.0°C, J.K. Lowry & K. Dempsey, MV *Martrudan*, 8–9 April 1994, stn TAS-397; 4 specimens, AM P.51843, same data, 9–10 April 1994, stn TAS-414; 3 specimens, AM P.51840 and 1 specimen, AM P.71631, same data, stn TAS-399; 2 specimens, AM P.51841, east of Fortescue Bay, 43°07.36'S 145°13.75'E, 400 m, baited trap, 10.0°C, J.K. Lowry & K. Dempsey, MV *Martrudan*, 8–9 April 1994, stn TAS-400; 1 specimen, AM P.51844, same data, 9–10 April 1994, stn TAS-418; many specimens, AM P.74784, Hill U, south-southeast of South East Cape, 44°19'30"S 147°10'48"E, 1155 m, baited trap, 27 January 1997, CSIRO Seamount Survey, RV *Southern Surveyor*, stn SS01/97/39; 1 specimen, AM P.74785, Hill U, 82.8 km south-southeast of South East Cape, 44°19'12"S 147°07'12"E, 1083 m, baited trap, 28 January 1997, CSIRO Seamount Survey, RV *Southern Surveyor*, stn SS01/97/41; many specimens, AM P.74786, Hill V, south-southeast of South East Cape, 44°23'36"S 147°10'42"E, 1400 m, baited trap, 30 January 1997, CSIRO Seamount Survey, RV *Southern Surveyor*, stn SS01/97/61; 15 specimens, AM P.74786, Hill D1, south-southeast of South East Cape, 44°23'24"S 147°16'12"E, 1942 m, baited trap, 31 January 1997, CSIRO Seamount Survey, RV *Southern Surveyor*, stn SS01/97/65.

Type locality. 66 km south of Rodondo Island, Victoria, central Bass Strait, Australia, 39°48.6'S 146°18.8'E, 82 m depth.

Etymology. The species is named for its type locality.

Diagnostic description. *Head* lateral cephalic lobe rounded, apically rounded; eyes reniform. *Antenna 1* peduncular article 1 without anterodistal lobe; article 2 without anterodistal lobe; accessory flagellum present, not forming cap, 3-articulate, terminal article not offset; flagellum with strong 2-field callynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, broadly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, dis-

tally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 present, setal-tooth 7, left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 2 long apical robust setae.

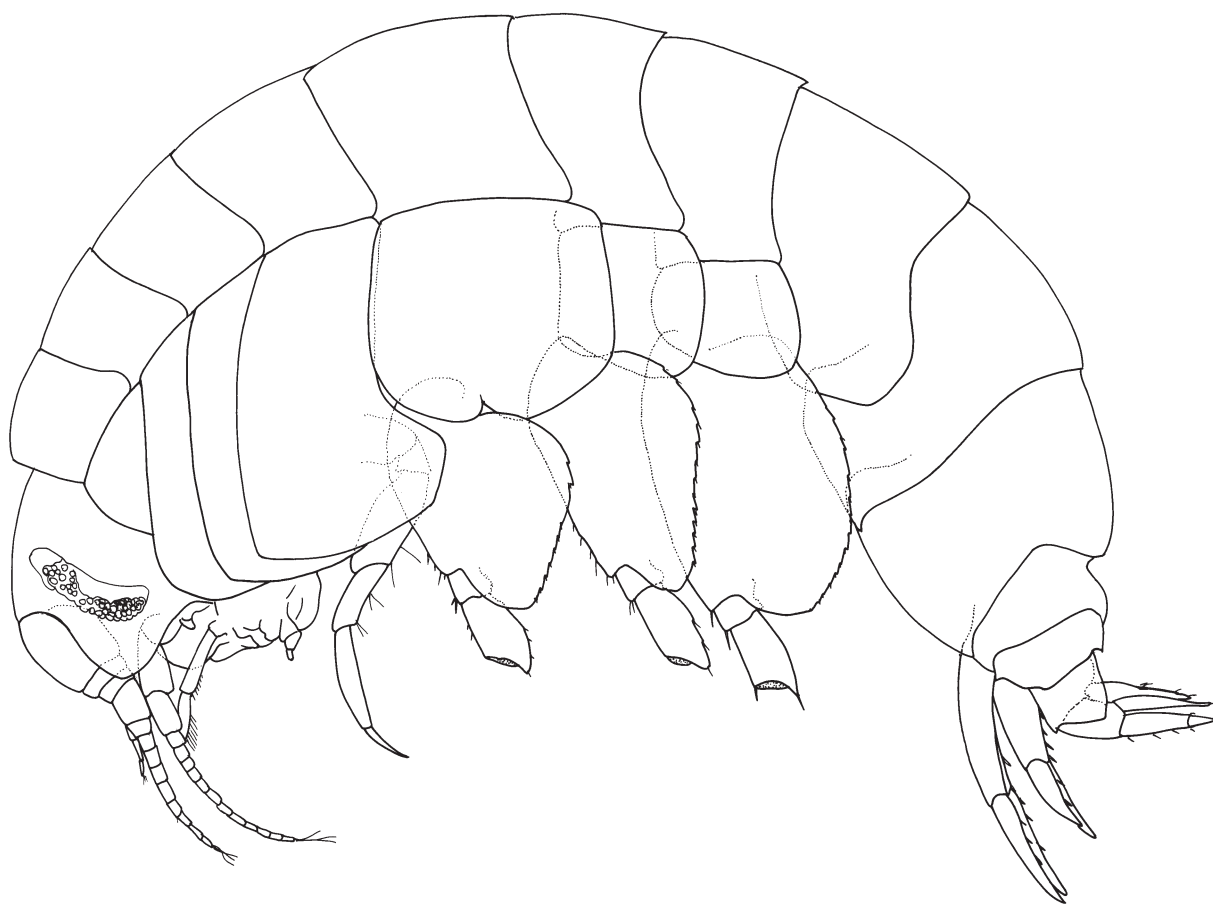


FIGURE 33. *Tryphosella rodondo* sp. nov. Paratype, female, 5.0 mm, AM P.85307, south of Rodondo Island, Victoria, central Bass Strait.

Gnathopod 1 subchelate; coxa small (length 1.3 x breadth), subtriangular, tapering distally; basis densely setose along anterior margin; ischium short; carpus long, longer than propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm slightly acute, entire, straight. *Gnathopod 2* palm transverse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, not posteroproximally excavate, posterior margin weakly serrate. *Pereopod 7* basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. **Epimeron 3** posterior margin smooth, posteroventral corner acutely produced. *Urosomite 1* not projecting over urosomite 2, with anterodorsal notch and slightly rounded boss. *Uropods 1 and 2* outer rami without stout striated robust setae. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange, with 3 short apicomedial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. *Telson* moderately cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Head* lateral cephalic lobe subtriangular, apically subacute. *Antenna 1* calceoli present, small. *Antenna 2* flagellum long, calceoli present. *Uropod 3* with plumose setae on both rami.

Remarks. *Tryphosella rodondo* and *T. chinchilla* both have gnathopod 1 with a significantly reduced coxa and a densely setose anterior margin on the basis. In *T. rodondo* there are no robust setae on the proximal articles of the flagellum of antenna 1 (present in *T. chinchilla*) and a moderately cleft telson (deeply cleft in *T. chinchilla*). See also Remarks for *T. chinchilla*.

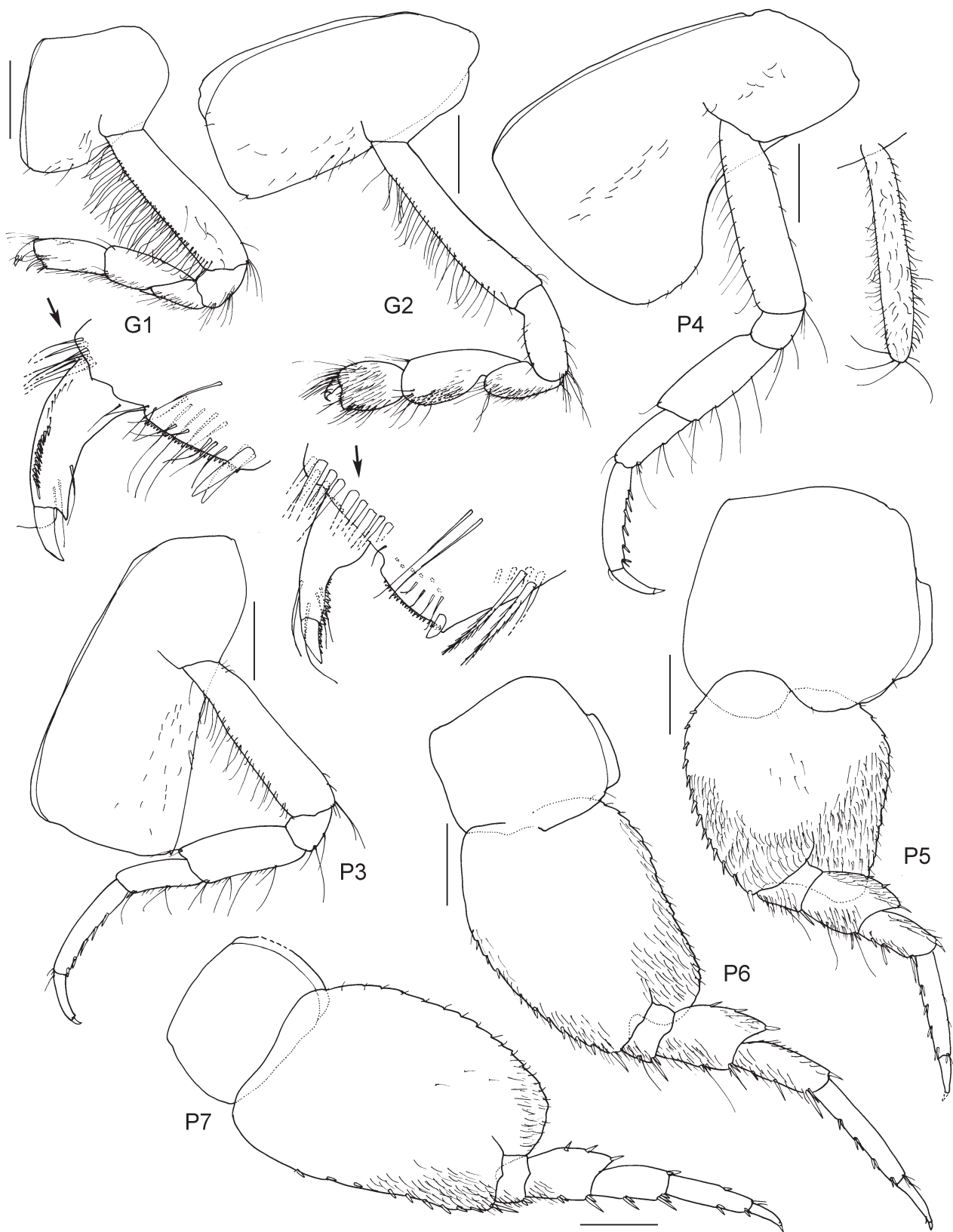


FIGURE 35. *Tryphosella rodondo* sp. nov. Holotype, female, 5.0 mm, MV J62300, south of Rodondo Island, Victoria, central Bass Strait. Scales represent 0.2 mm.

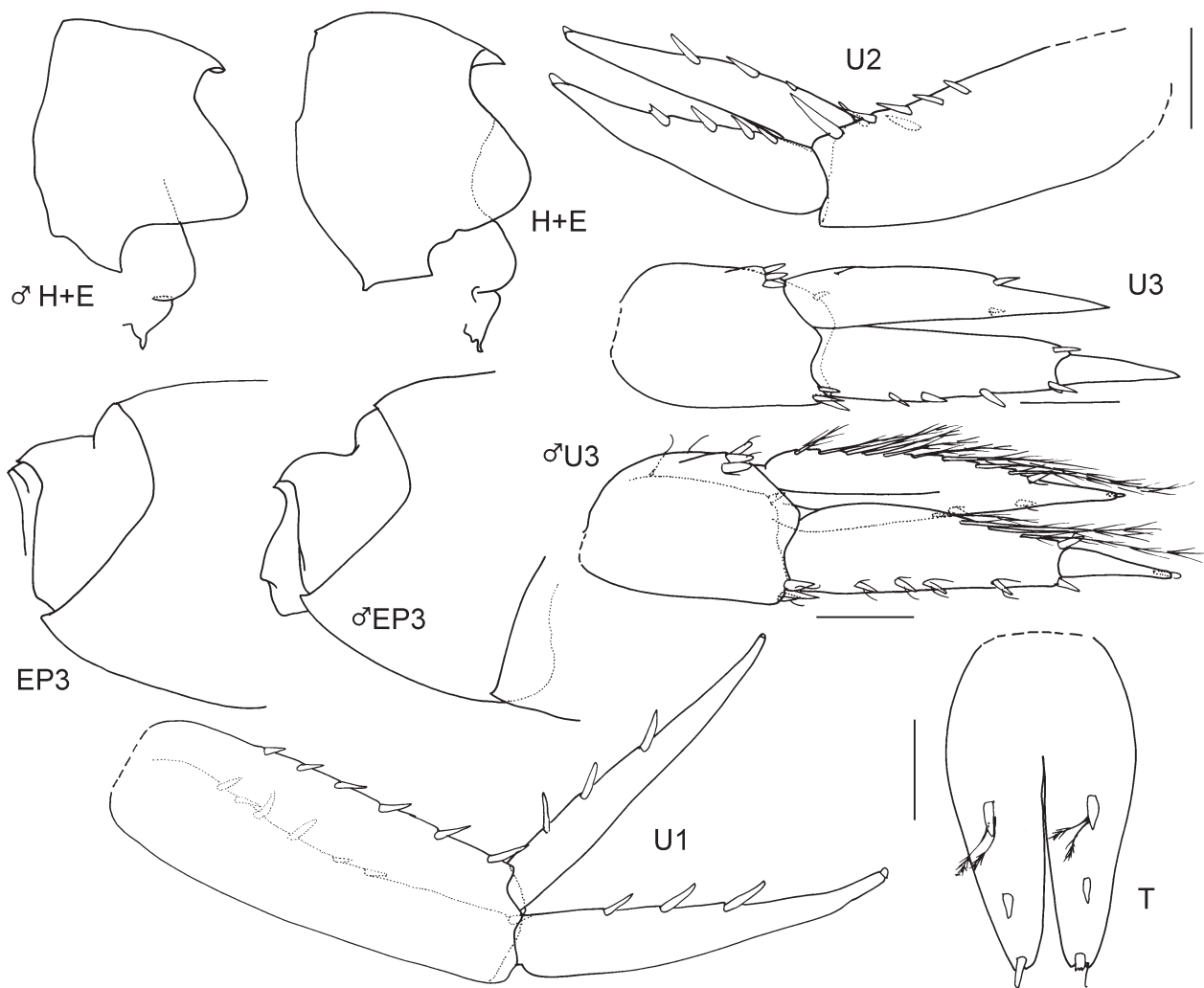


FIGURE 36. *Tryphosella rodondo* sp. nov. Holotype, female, 5.0 mm, MV J62300, south of Rodondo Island, Victoria, central Bass Strait; paratype, male, 5.0 mm, AM P.71625, east of Fortescue Bay, Tasmania. Scales represent 0.1 mm.

Tryphosella seasana Lowry & Stoddart, 2009

Tryphosella sp. 483. —Lowry & Smith, 2003: 56.

Tryphosella seasana Lowry & Stoddart, 2009: 593, figs 21, 22.

Type locality. East of Fitzroy Reef, Queensland, Australia, 23°32'53"S 152°16'44"E, 100 m depth.

Material examined. *New South Wales*: 1 ovigerous female, AM P.52158, north-east of Coffs Harbour, 30°14.84'S 153°27.55'E, 182.88 m, baited trap, 11–12 August 1993, P. Berents, R.T.S Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-869; 2 ovigerous females, AM P.52159, north-east of Coffs Harbour, 30°14.63'S 153°27.68'E, 199 m, baited trap, set 1400 hrs, retrieved 1030 hrs, 12–13 August 1993, P. Berents, R.T. Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-882; 1 ovigerous female, AM P.52160, same data, 30°14.63'S 153°27.68'E, stn NSW-884; 1 male, AM P.57656, same data, 30°15.75'S 153°21.98'E, 98 m, set 1520 hrs, retrieved 1115 hrs, stn NSW-887.

Remarks. *Tryphosella seasana* is uncommon (usually 20 to 50 but up to 450 specimens in a trap) off the southern Queensland coast in 50 to 100 m depth and the northern New South Wales coast (1 to 2 specimens per trap) between 100 and 200 m depth. These records extend the distribution of *T. seasana* down the east coast of Australia to Coffs Harbour.

Distribution. Southern Queensland, northern New South Wales, eastern Australia; 50–200 m depth.

***Tryphosella sorell* sp. nov.**

(Figs 37–40)

Tryphosella sp. 135. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, ovigerous (4 eggs), 5.6 mm, AM P.69380, about 100 m west of Turners Rock and 80 m offshore, north side of Cape Sorell, Tasmania, Australia, 42°11.5'S 145°10.8'E, 13 m, baited trap, probably rocky bottom with sand patches, 27–28 April 1991, RV *Flying Scud*, J.K. Lowry & S.J. Keable, stn TAS-301. PARATYPES: 1 male, 5.5 mm, AM P.69381; 1 male, AM P.69382; 1 female, AM P.69383; 1085 specimens, AM P.69384; same data as Holotype.

Additional material examined. *New South Wales*: 1 specimen, AM P.48399, off Wollongong, 34°26.42'S 150°58.04'E, 50 m, baited trap, 7–8 May 1993, P. Freewater, MV *Robin E*, stn NSW-792; 6 specimens, AM P.44299, off Wollongong, 34°26.54'S 150°57.98'E, 50 m, baited trap, 27–28 March 1994, J.K. Lowry & K. Dempsey, MV *Robin E*, stn NSW-939; 1 specimen, AM P.44315, same data, stn NSW-940; 5 specimens, AM P.44331, same data, 28–29 March 1994, stn NSW-958. *Victoria*: 85 specimens, AM P.84634, Bay of Islands, 38°35'S 142°49.5'E, 1.5 m, airlift over rubble, 28 April 1988, R.T. Springthorpe, stn VIC-76. *Tasmania*: 14 specimens, MV J2682, 20 km north-north-east of North Point, central Bass Strait, 40°38.0'S 145°23'E, 36 m, muddy shell grit, epibenthic sled, 4 November 1980, M. Gomon & G.C.B. Poore, FRV *Sarda*, stn BSS 117S; 1 ovigerous female, 6.1 mm, AM P.71615, 1 mature male, 4.8 mm, AM P.71616, 1 immature male, 4.5 mm, AM P.71617 and 296 specimens, AM P.51830, east of Fortescue Bay, north of Hippolyte Rocks, 43°06.70'S 148°03.45'E, 100 m, baited trap, 15.8°C, 17–18 April 1993, J.K. Lowry & P. Freewater, MV *Tasmanian Enterprise*, stn TAS-371; 163 specimens, AM P.51831, same data, stn TAS-372; 1 specimen, AM P.51832, mouth of Fortescue Bay, 43°07.77'S 145°59.47'E, 50 m, baited trap, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-386; 1 specimen, AM P.58249, east of Fortescue Bay, north of Hippolyte Rocks, 43°06.70'S 148°03.45'E, 100 m, baited trap, 8–9 April 1994, J.K. Lowry & K. Dempsey, MV *Martrudan*, stn TAS-389. *South Australia*: many specimens, SAM C6950 and 21 specimens, AM P.85257, Marion Bay, Yorke Peninsula, approx. 35°14'S 136°59'E, 3 m, on dead crayfish in pot, 3 January 1977, W. Zeidler; many specimens, SAM C6951, Marion Bay, Yorke Peninsula, approx. 35°14'S 137°00'E, 6–10 m, bait in craypot, 29 January 1979, W. Zeidler; 35 specimens, SAM C6952, Marion Bay, Yorke Peninsula, approx. 35°14'S 136°59'E, 15 m, on bait in cray pot, 28 January 1980, W. Zeidler.

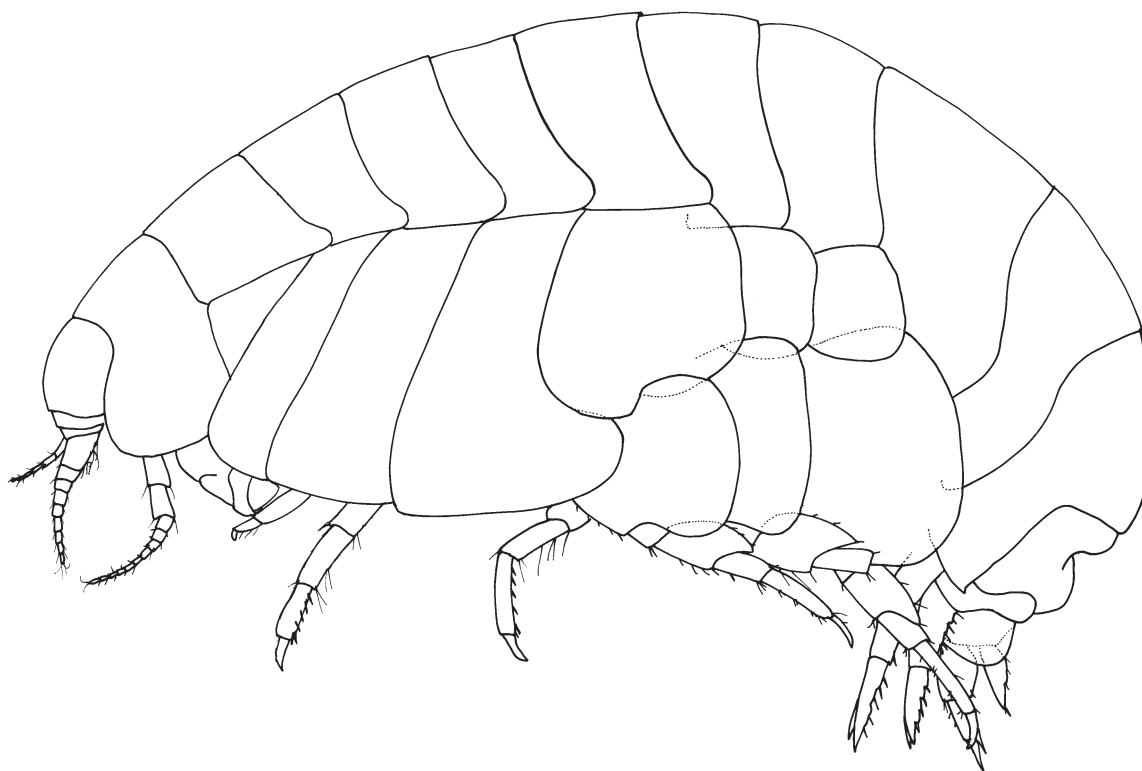


FIGURE 37. *Tryphosella sorell* sp. nov. Paratype, female, 6.1 mm, AM P.71615, east of Fortescue Bay, Tasmania.

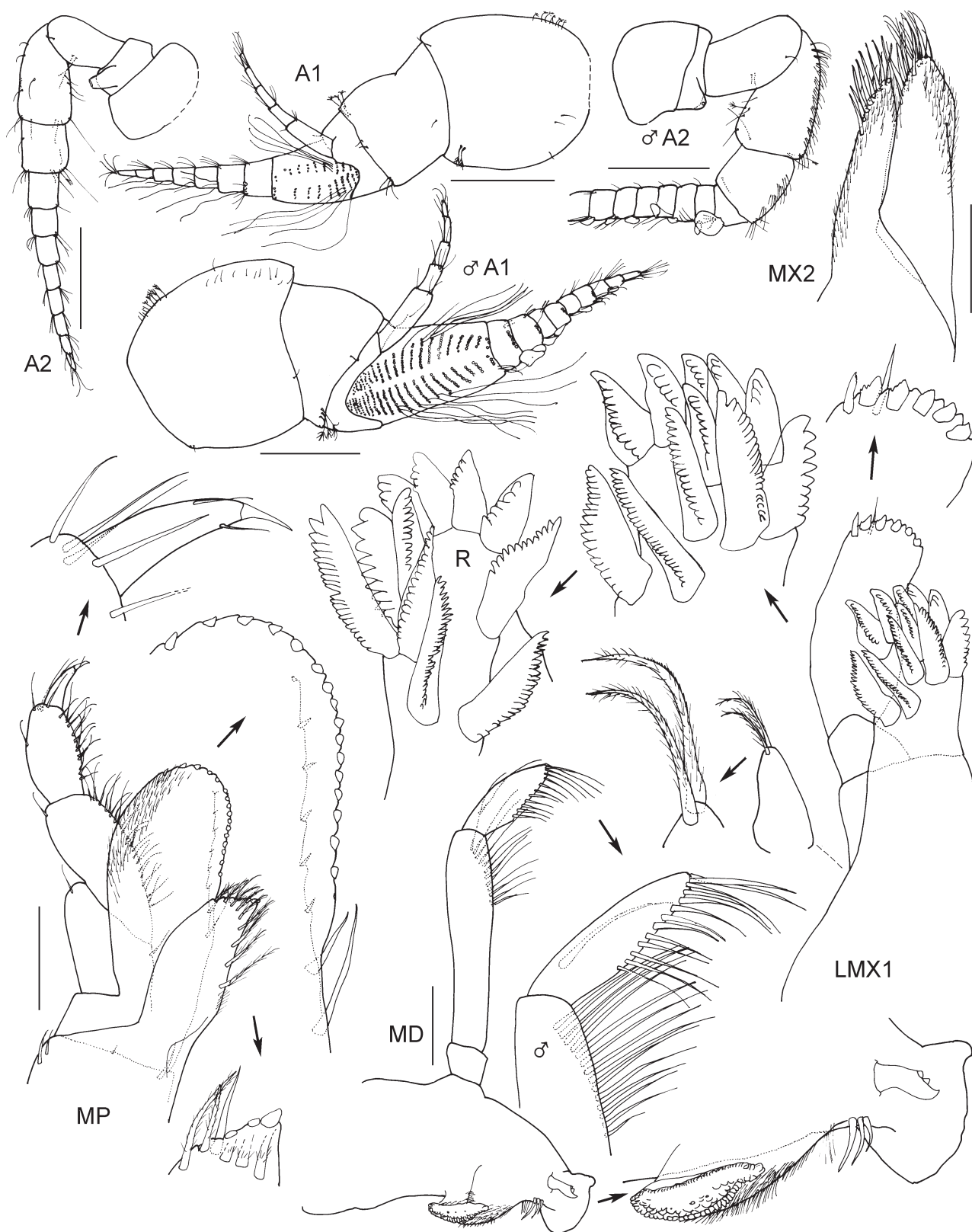


FIGURE 38. *Tryphosella sorell* **sp. nov.** Holotype, female, 5.6 mm, AM P.69380; paratype, male, 5.5 mm, AM P.69381, Cape Sorell, Tasmania. Scales represent 0.2 mm.

Type locality. About 100 m west of Turners Rock and 80 m offshore, north side of Cape Sorell, Tasmania, Australia, 42°11.5'S 145°10.8'E, 13 m depth.

Etymology. The species is named for its type locality.

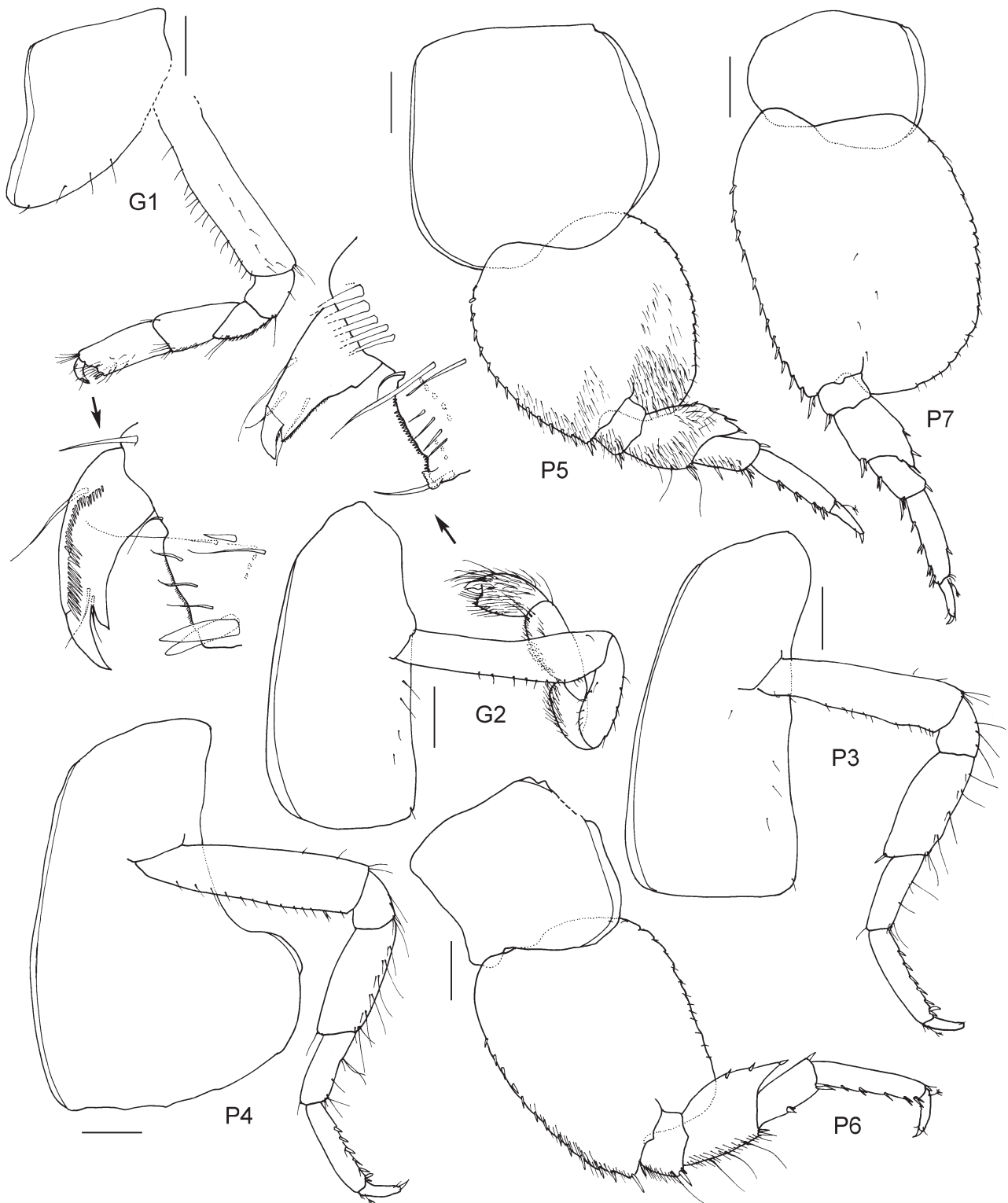


FIGURE 39. *Tryphosella sorell* **sp. nov.** Holotype, female, 5.6 mm, AM P.69380, Cape Sorell, Tasmania. Scales represent 0.2 mm.

Diagnostic description. *Head* lateral cephalic lobe rounded, apically rounded; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field callynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced equally with upper lip, broadly rounded; upper lip slightly produced,

straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 1 short apicolateral robust seta and 3 short apical robust setae.

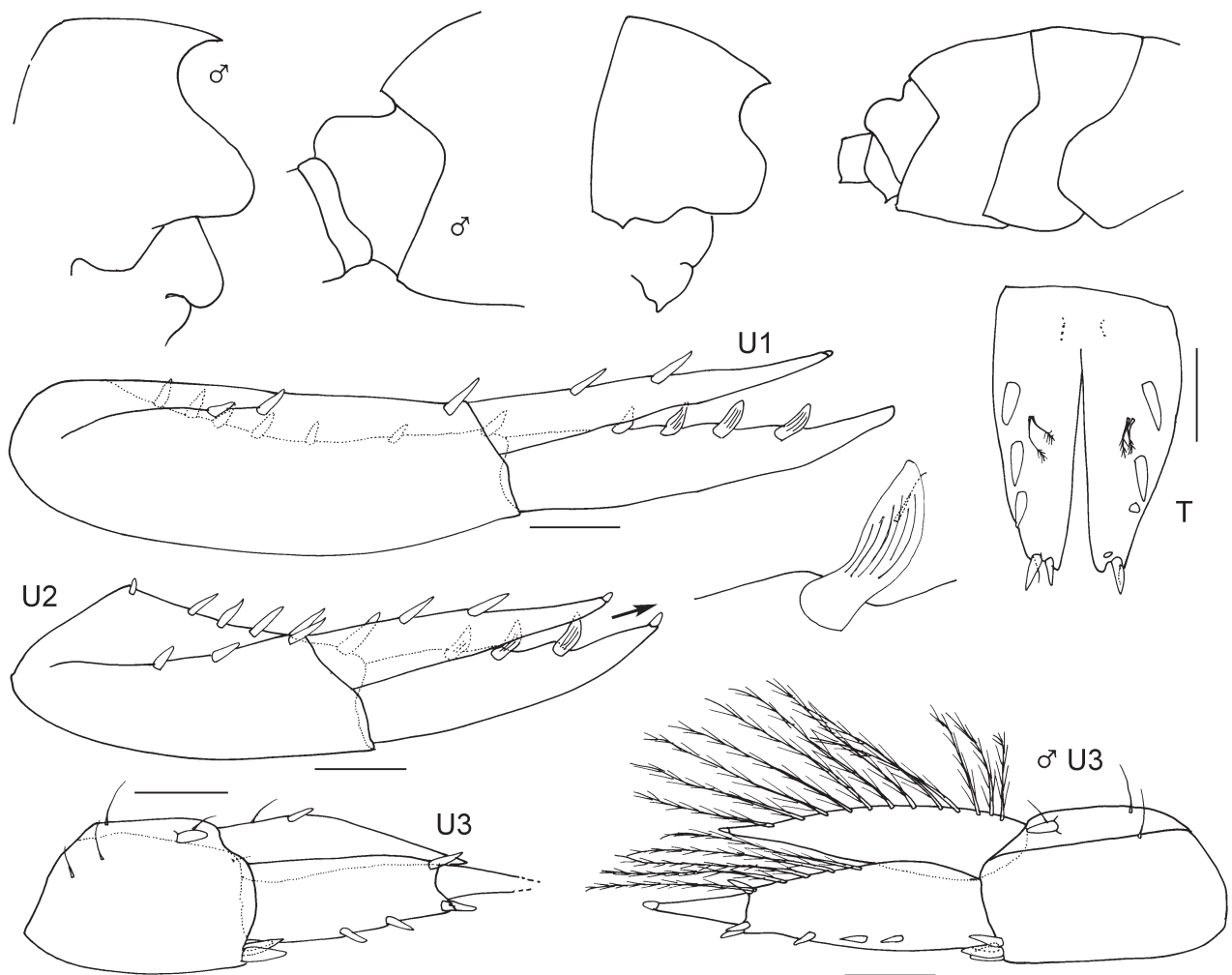


FIGURE 40. *Tryphosella sorell* **sp. nov.** Holotype, female, 5.6 mm, AM P.69380; paratype, male, 5.5 mm, AM P.69381, Cape Sorell, Tasmania. Scales represent 0.1 mm.

Gnathopod 1 subchelate; **coxa small (length 1.3 x breadth), subtriangular, tapering distally**; basis moderately setose along anterior margin; ischium short; carpus long, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, **palm transverse**. **Gnathopod 2** palm transverse. **Pereopod 4** coxa without distinct lateral ridge, with a well-developed posteroventral lobe. **Pereopod 5** coxa without distinct lateral ridge, without umbo; basis about as long as broad, not posteroproximally excavate, posterior margin not serrate. **Pereopod 7** basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. **Epimeron 3** posterior margin smooth, posteroventral corner subquadrate. **Urosomite 1** not projecting over urosomite 2, **with anterodorsal notch and rounded boss**. **Uropods 1 and 2 outer rami with all robust setae stout and striated**. **Uropod 2** inner ramus without constriction. **Uropod 3** peduncle without dorsolateral flange, with 1 short apicomедial robust seta; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. **Telson** deeply cleft, with dorsal robust setae, with 2 apical robust setae on each lobe.

Male (sexually dimorphic characters). *Head* lateral cephalic lobe subtriangular. *Antenna 1* calceoli present, proximal calceolus very large. *Antenna 2* peduncular articles 4 and 5 enlarged; flagellum long, calceoli present. *Epistome/Upper lip* epistome produced beyond upper lip, narrowly rounded. *Uropod 3* with plumose setae on both rami.

Remarks. *Tryphosella sorell* is one of the group of six Australian species with stout striated robust setae on the outer rami of uropods 1 and 2 (see Remarks under *T. fortescue*). Only two species, *T. freycinet* and *T. sorell*, have all of the robust setae in this form. See Remarks under *T. freycinet*.

Tryphosella sorell appears to be a widespread shallow-water scavenger in New South Wales, Victoria, Tasmania and South Australia from the subtidal down to 100 m depth (up to about 1085 specimens in a trap).

Distribution. South-eastern and southern Australia, 1.5–100 m depth.

***Tryphosella tathra* sp. nov.**

(Figs 41–43)

Tryphosella sp. 485. —Lowry & Smith, 2003: 56.

Type material. HOLOTYPE, female, ovigerous (4 eggs), 3.8 mm, AM P.70546, off mouth of Moona Moona Creek, Jervis Bay, New South Wales, Australia, 35°03.5'S 150°41'E, 8 m, air-lifted sediment, 17 December 1982, P.B. Berents, stn NSW-263. PARATYPES: 1 male, 3.2 mm, AM P.70547, same data; 1 male, 3.1 mm, AM P.70548, same data; 2 females and 1 male, AM P.70549, same data; 1 immature specimen, AM P.70545, same data, stn NSW-262; 1 adult male, AM P.70542, same locality, plankton net by hand along bottom, 2100 hrs, 1 December 1983, P.B. & P.M. Berents, stn NSW-1036.

Additional material examined. *New South Wales:* 1 specimen, AM P.57647, north-east of Coffs Harbour, 30°15.94'S 153°21.90'E, 92.7 m, baited trap, 11–12 August 1993, P. Berents, R.T. Springthorpe & W. Vader, MV *Cheryl Lee*, stn NSW-870; 36 specimens, AM P.52161, same locality, 100 m, baited trap, 18.6°C, 8–9 September 1994, J.K. Lowry & K. Dempsey, MV *Carrie Anne*, stn NSW-984; 1 ovigerous female (3 eggs), 4.5 mm, AM P.82864, 1 mature male, 4.4 mm, AM P.82865, 1 immature male, 4.0 mm, AM P.82866 and 63 specimens, AM P.52162, same data, stn NSW-985; 24 specimens, AM P.52230, same data, 9–10 September 1994, stn NSW-1006; 5 specimens, AM P.52231, same data, stn NSW-1007; 2 specimens, AM P.48134, due east of Coffs Harbour, 30°17.49'S 153°13.90'E, 50 m, baited trap, 9–10 September 1994, J.K. Lowry & K. Dempsey, MV *Carrie Anne*, stn NSW-1002; many specimens, AM P.70536, eastern end of Shoal Bay, Port Stephens, 32°42.9'S 152°10.8'E, 6 m, baited trap set in *Halophila* bed, 30–31 May 1988, J.K. Lowry & S.J. Keable, RV *Flying Scud*, stn NSW-290; 2 specimens, AM P.70538, same data, stn NSW-296; 6 specimens, AM P.70537, off Shoal Bay Jetty, Port Stephens, 32°43.1'S 152°10.5'E, 10 m, baited trap set on sand with shelly patches, set 1630–1730 hrs, retrieved 2030–2230 hrs, 30–31 May 1988, J.K. Lowry & S.J. Keable, RV *Flying Scud*, stn NSW-292; 1 specimen, AM P.70539, same locality, baited trap set in a patch of *Zostera*, set 0830–1000 hrs, retrieved 1630–1700 hrs, 31 May 1988, J.K. Lowry & S.J. Keable, RV *Flying Scud*, stn NSW-297; 27 specimens, AM P.70540, Barnes Rocks, Port Stephens, 32°41.1'S 152°9.5'E, 5 m, baited trap set among *Ecklonia* and rocks, set 1000–1100 hrs, retrieved 0730–0830 hrs, 1–2 June 1988, J.K. Lowry & S.J. Keable, RV *Flying Scud*, stn NSW-310; 1 ovigerous female, 5 immatures, AM P.70541, Fairlight, Port Jackson, 33°48'S 151°16.5'E, 3 m, baited trap on coarse sand bottom below *Ecklonia*, 8–9 January 1988, S.J. Keable & D. Townsend, stn 7; 7 specimens, AM P.70544, Watsons Bay ferry jetty, Port Jackson, 33°50'48"S 151°16'48"E, 3 m, baited trap on silt/sand near algae, 28–29 August 1993, A.R. Parker; 7 specimens, AM P.48394, off Wollongong, 34°26.42'S 150°58.04'E, 50 m, baited trap, 19.5°C, 7–8 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-792; 8 specimens, AM P.48228, same data, stn NSW-793; 8 specimens, AM P.48108, off Wollongong, 34°26.44'S 150°57.55'E, 50 m, baited trap, 19.5°C, 6–7 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-773; 4 specimens, AM P.44323, off Wollongong, 34°26.54'S 150°57.98'E, 50 m, baited trap, 28–29 March 1994, J.K. Lowry & K. Dempsey, MV *Robin E*, stn NSW-956; 15 specimens, AM P.46873, off Wollongong, 34°28.15'S 151°02.37'E, 100 m, baited trap, 15.5°C, 6–7 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-776; 3 specimens, AM P.46882, same data, stn NSW-778; 20 specimens, AM P.52233, off Wollongong, 34°28.21'S 151°02.29'E, 100 m, baited trap, 15.5°C, 7–8 May 1993, P. Freewater, S. Keable & W. Vader, MV *Robin E*, stn NSW-795; 1 specimen, AM P.44267, off Wollongong, 34°31.48'S 151°13.22'E, 200 m, baited

trap, 12.6°C, 27–28 March 1994, J.K. Lowry & K. Dempsey, MV *Robin E*, stn NSW-944; 1 specimen, AM P.52232, off Wollongong, 34°32.02'S 151°13.00'E, 200 m, baited trap, 13.7°C, P. Freewater, S. Keable & W. Vader, MV *Robin E*, 6–7 May 1993, stn NSW-781; 24 specimens, AM P.44285, off Wollongong, 100 m, baited trap, 28–29 March 1994, J.K. Lowry & K. Dempsey, MV *Robin E*, stn NSW-961.

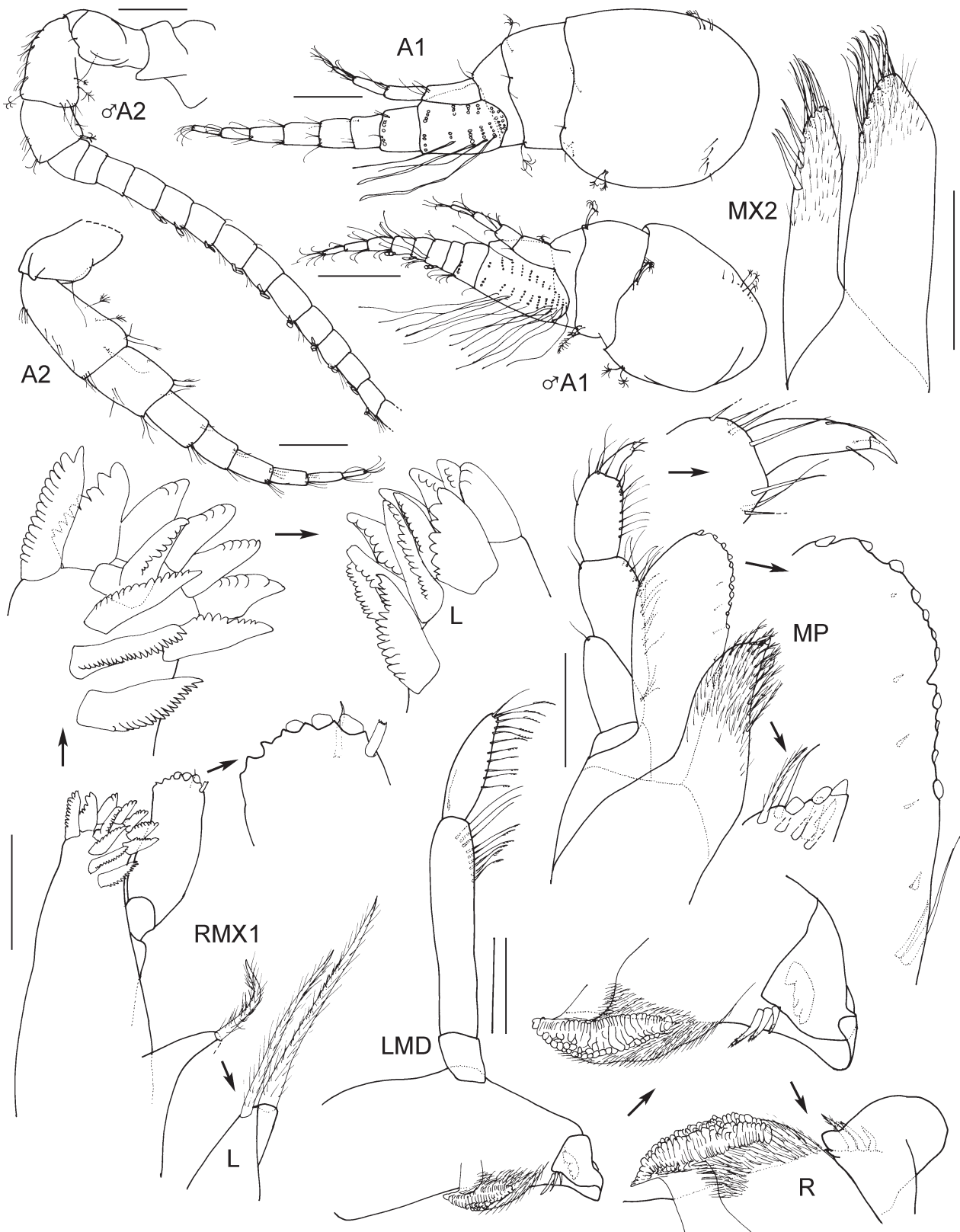


FIGURE 41. *Tryphosella tathra* sp. nov. Holotype, female, 3.8 mm, AM P.70546; paratype, male, 3.2 mm, AM P.70547, Jervis Bay, New South Wales. Scales represent 0.1 mm.

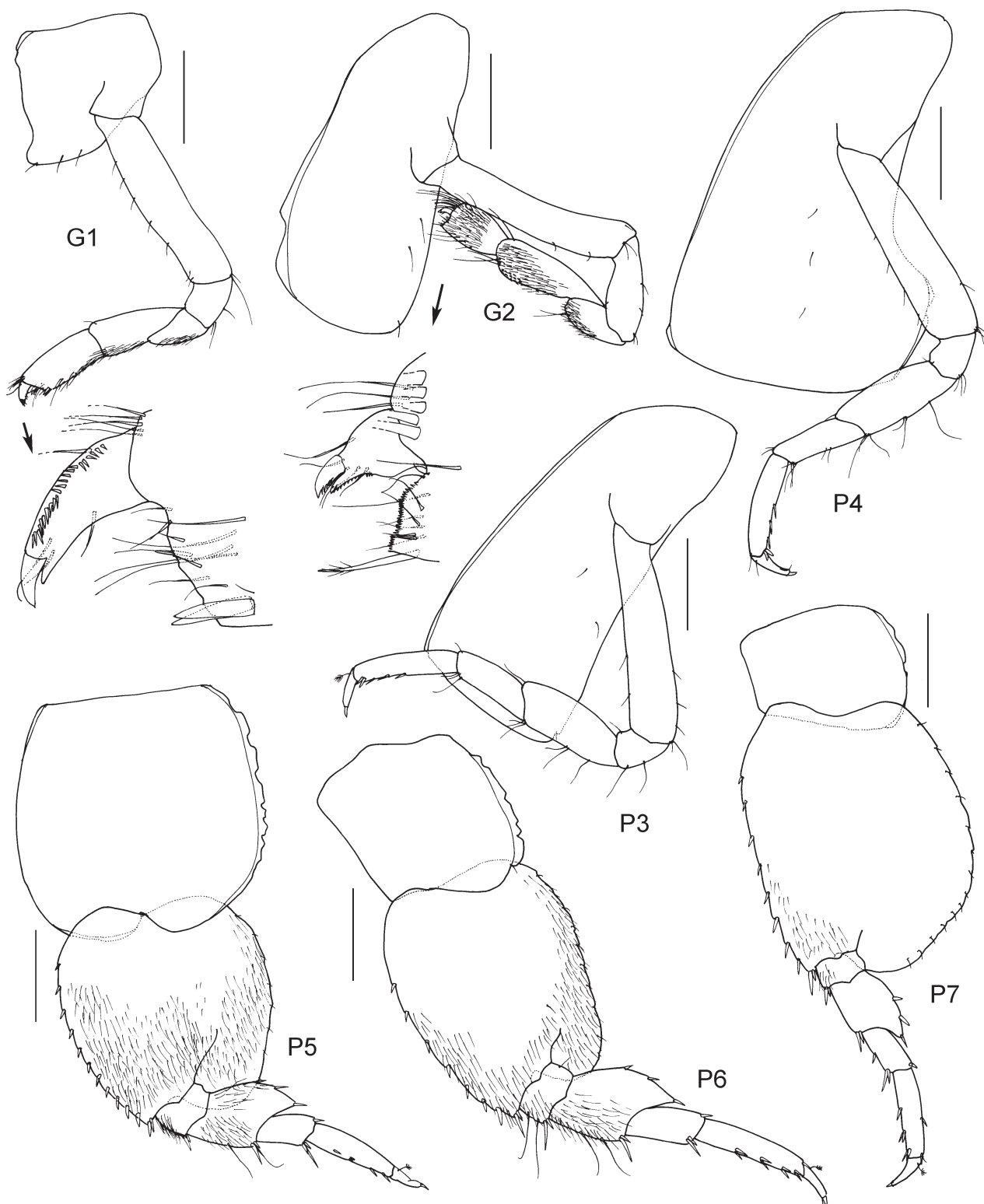


FIGURE 42. *Tryphosella tathra* sp. nov. Holotype, female, 3.8 mm, AM P.70546, Jervis Bay, New South Wales. Scales represent 0.2 mm.

Type locality. Off mouth of Moona Moona Creek, Jervis Bay, New South Wales, Australia, 35°03.5'S 150°41'E, 8 m depth.

Etymology. The species is named for the town of Tathra on the south coast of New South Wales.

Diagnostic description. *Head* lateral cephalic lobe rounded, apically rounded; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal arti-

cle not offset; flagellum with weak 2-field callynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced equally with upper lip, narrowly rounded; upper lip slightly produced, rounded apically. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae and serrations. *Maxilliped* basis without recurved hook; outer plate with 2 short apical robust setae.

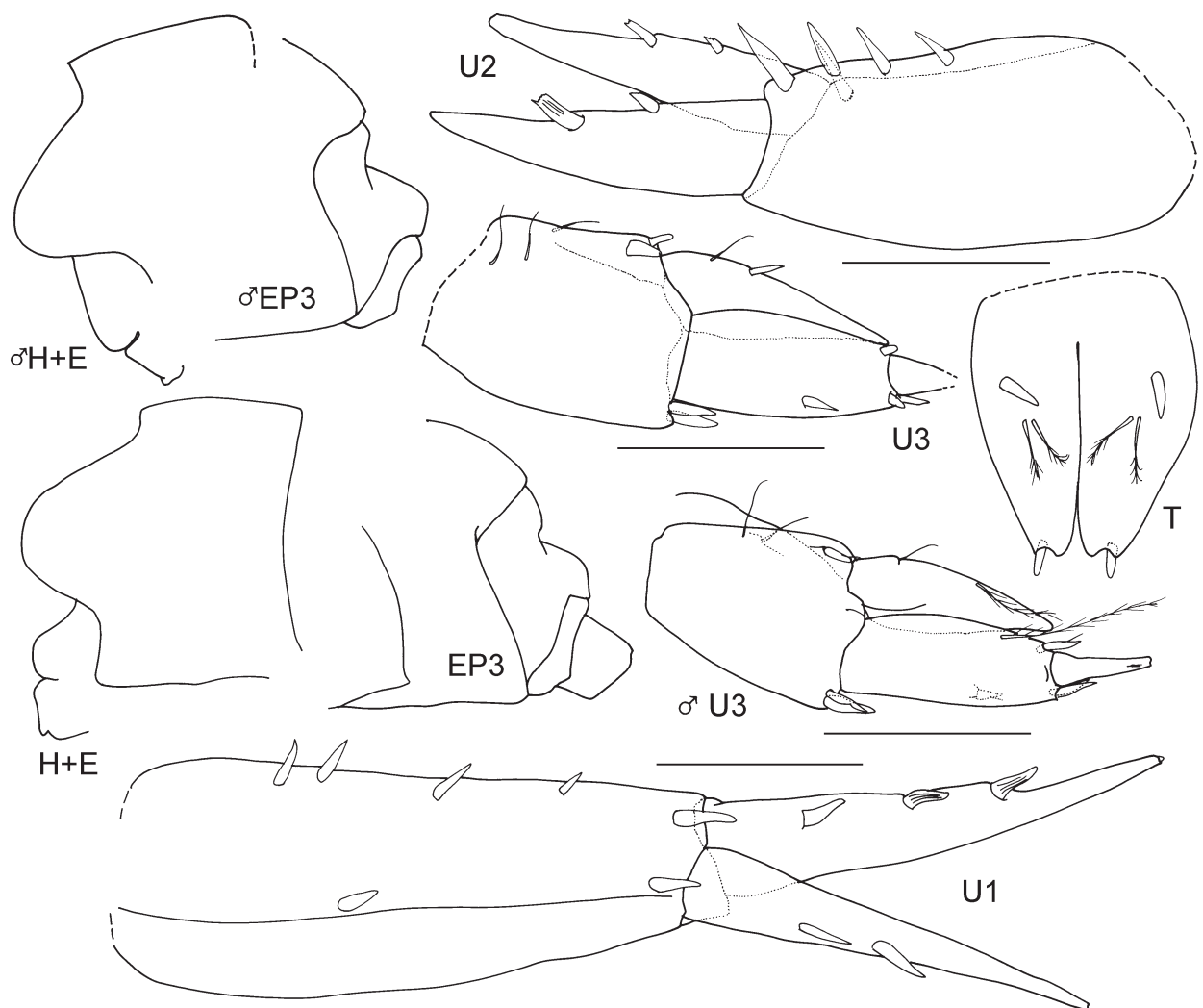


FIGURE 43. *Tryphosella tathra* sp. nov. Holotype, female, 3.8 mm, AM P.70546; paratype, male, 3.2 mm, AM P.70547, Jervis Bay, New South Wales. Scales represent 0.1 mm.

Gnathopod 1 subchelate; coxa small (length 1.0 x breadth), subtriangular, tapering distally; basis sparsely setose along anterior margin; ischium short; carpus long, longer than propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm slightly acute, entire, straight. **Gnathopod 2** palm slightly obtuse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, without photophore, not posteroproximally excavate, posterior margin not serrate. *Pereopod 7* basis posterodistally produced less than half-way along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. *Epimeron 3* posterior margin smooth, posteroventral corner subquadrate. *Urosomite 1* not projecting over urosomite 2. **Uropods 1 and 2** outer rami with distal stout striated robust setae. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without

dorsolateral flange, with 2 short apicomedial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. *Telson* deeply cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Antenna 1* flagellum with strong 2-field callynophore. *Antenna 2* flagellum long, calceoli present. *Epistome/Upper lip* epistome slightly produced beyond upper lip, broadly rounded. *Uropod 3* with plumose setae on both rami.

Remarks. *Tryphosella tathra* is one of the group of six Australian species with stout striated robust setae on the outer rami of uropods 1 and 2 (see Remarks under *T. fortescue*). *Tryphosella tathra* is most similar to *T. orana* in having: a significantly reduced coxa 1; 2 apical robust setae on the outer plate of the maxilliped; a slightly obtuse gnathopod 2 palm; 2 short apicomedial robust setae on the peduncle of uropod 3; and 1 distal robust seta on each lobe of the telson. *Tryphosella tathra* shows subtle differences from *T. orana* in the following characters: the epistome is produced equally with the upper lip and narrowly rounded (produced beyond the upper lip and broadly rounded in *T. orana*); gnathopod 1 carpus is longer than propodus (subequal in length in *T. orana*); and the posteroventral corner of epimeron 3 is subquadrate (narrowly rounded in *T. orana*). *Tryphosella orana* is known only from the south-west corner of Western Australia and *T. tathra* is known only from the central New South Wales coast in eastern Australia.

Tryphosella tathra occurred frequently along the New South Wales coast from Coffs Harbour to Jervis Bay, most commonly around 100 m depth (up to 66 specimens in a trap).

Distribution. Central New South Wales coast, eastern Australia; 3–200 m depth.

***Tryphosella toowoomba* sp. nov.**

(Figs 44–46)

Type material. HOLOTYPE, female, ovigerous (2 eggs), 4.4 mm, QM W29089, off Cape Moreton, Moreton Bay, Queensland, Australia, approx. 27°01'S 153°28'E, September 1995. PARATYPES: 1 male, 2.0 mm, QM W29090; 9 females, 5 males, QM W20919; same data as Holotype.

Type locality. Off Cape Moreton, Moreton Bay, Queensland, Australia, approx. 27°01'S 153°28'E.

Etymology. The species is named for the city of Toowoomba in southern Queensland.

Diagnostic description. **Head lateral cephalic lobe rounded**, apically rounded; eyes apparently absent. *Antenna 1* peduncular article 1 without anterodistal lobe; article 2 without anterodistal lobe; accessory flagellum present, not forming cap, 3-articulate, terminal article not offset; flagellum with strong 2-field callynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 long; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, broadly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 present, setal-tooth 7, left and right symmetrical, cuspidate along most of sinusoidal inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 1 short apical robust setae.

Gnathopod 1 subchelate; **coxa small (length 1.4 x breadth), subtriangular, tapering distally**; basis sparsely setose along anterior margin; ischium short; carpus long, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm moderately acute, entire, straight. **Gnathopod 2** palm moderately obtuse. **Pereopod 4** coxa without distinct lateral ridge, with a well-developed posteroventral lobe. **Pereopod 5** coxa without distinct lateral ridge, without umbo; basis about as long as broad, without photophore, not posteroproximally excavate, posterior margin not serrate. **Pereopod 7** basis posterodistally produced less than halfway along merus, not posterodistally excavate.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. **Epimeron 3** posterior margin smooth, **posteroventral corner acutely produced**. **Urosomite 1** not projecting over urosomite 2, **with posteriorly-directed elongate rounded boss**. **Uropods 1 and 2** rami without stout striated robust setae. **Uropod 2** inner ramus without constriction. **Uropod 3** peduncle without dorsolateral flange, with 2 short apicomedial robust setae; inner and outer rami well developed, outer ramus article 2 short, with plumose setae on both rami. **Telson** deeply cleft, with dorsal robust setae, with 2 apical robust setae on each lobe.

Male (sexually dimorphic characters). *Antenna 1* calceoli present, small. *Antenna 2* flagellum long, calceoli present. *Epistome/Upper lip* epistome slightly produced beyond upper lip, straight. ***Gnathopod 1* simple**; margins tapering distally, palm absent.

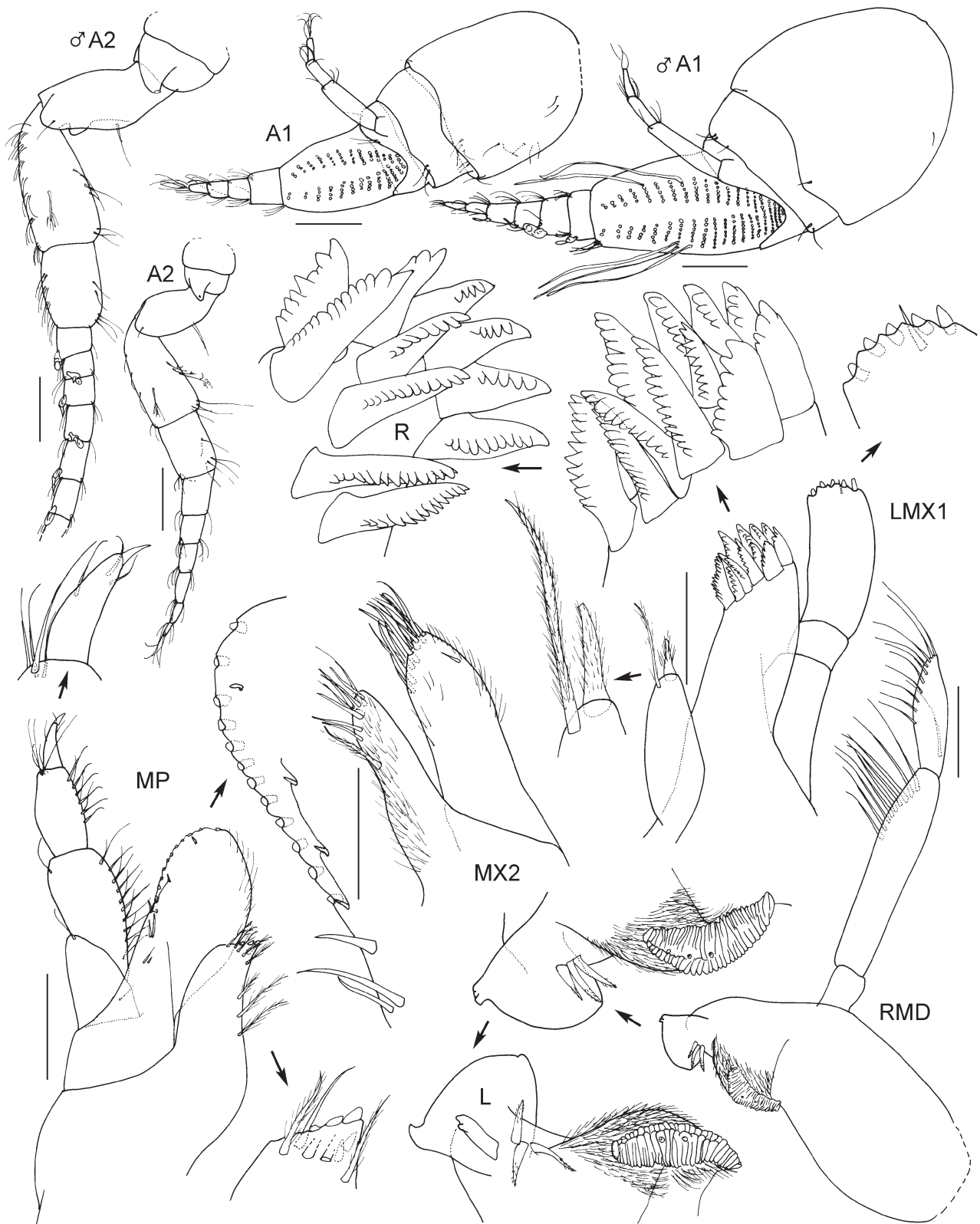


FIGURE 44. *Tryphosella toowoomba* sp. nov. Holotype, female, 4.4 mm, QM W29089; paratype, male, 2.0 mm, QM W29090; Moreton Bay, Queensland. Scales represent 0.1 mm.

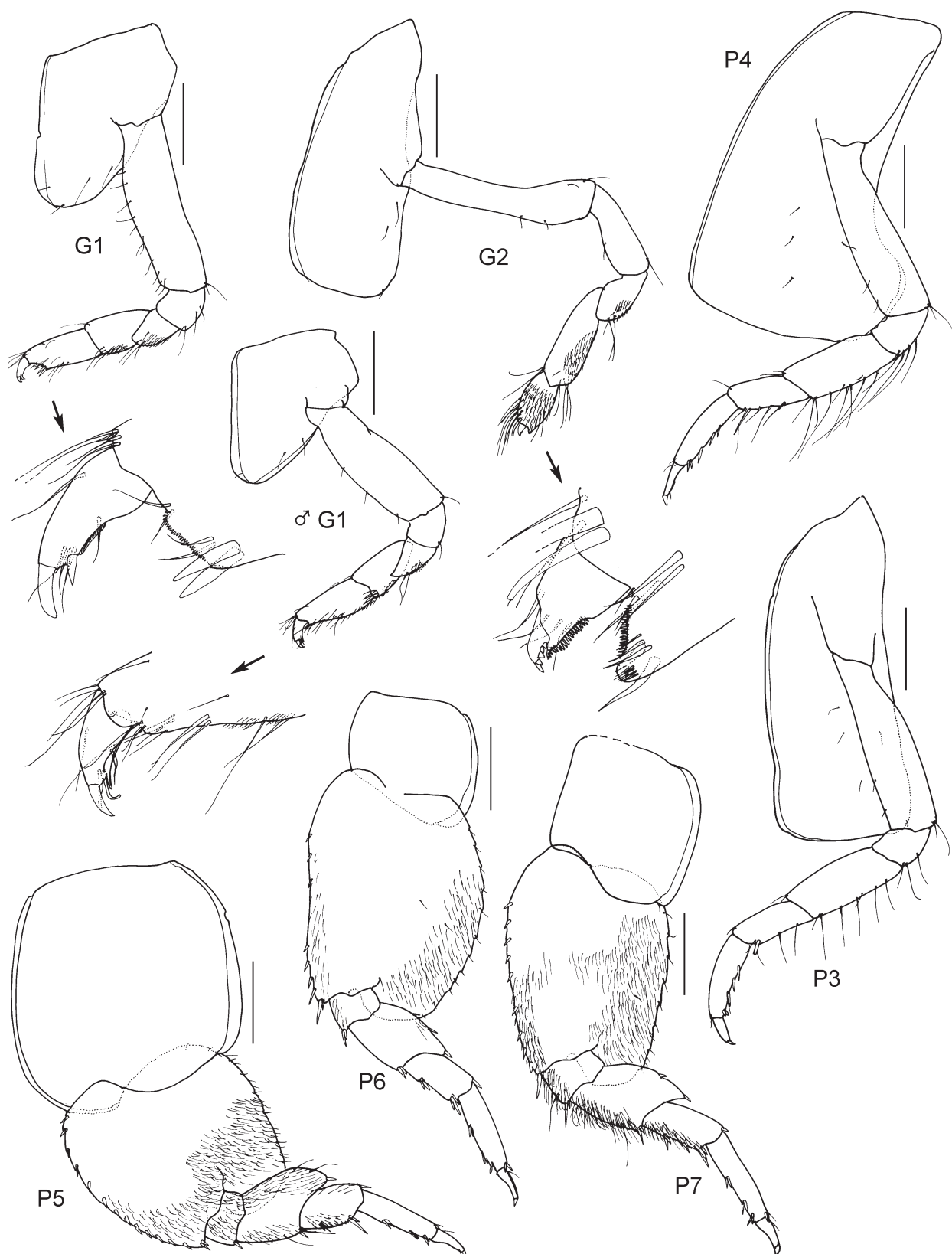


FIGURE 45. *Tryphosella toowoomba* **sp. nov.** Holotype, female, 4.4 mm, QM W29089; paratype, male, 2.0 mm, QM W29090; Moreton Bay, Queensland. Scales represent 0.2 mm.

Remarks. *Tryphosella toowoomba* belongs to a group of four Australian species (*T. betka*, *T. martrudan*, *T. toowoomba* and *T. wangaratta*) in which the male gnathopod 1 is simple. Within this group *T. betka*, *T. martrudan* and *T. toowoomba* have a significantly reduced subtriangular coxa 1. *Tryphosella toowoomba* and *T. martrudan*

both have an unusually shaped urosomite 1 forming a posteriorly-directed elongate rounded boss. *Tryphosella toowoomba* has many slight differences from *T. martrudan* (the slightly longer peduncular article 3 of antenna 2, the symmetrical maxilla 1 setal-tooth 7, the sparsely setose anterior margin of gnathopod 1 basis and the slightly more acute palm of gnathopod 1). The two species differ strongly in the presence of plumose setae on both rami of uropod 3 in the female *T. toowoomba* (none in *T. martrudan*) and the long antenna 2 of adult male *T. toowoomba* (short in *T. martrudan*).

Distribution. South-eastern Queensland, Australia.

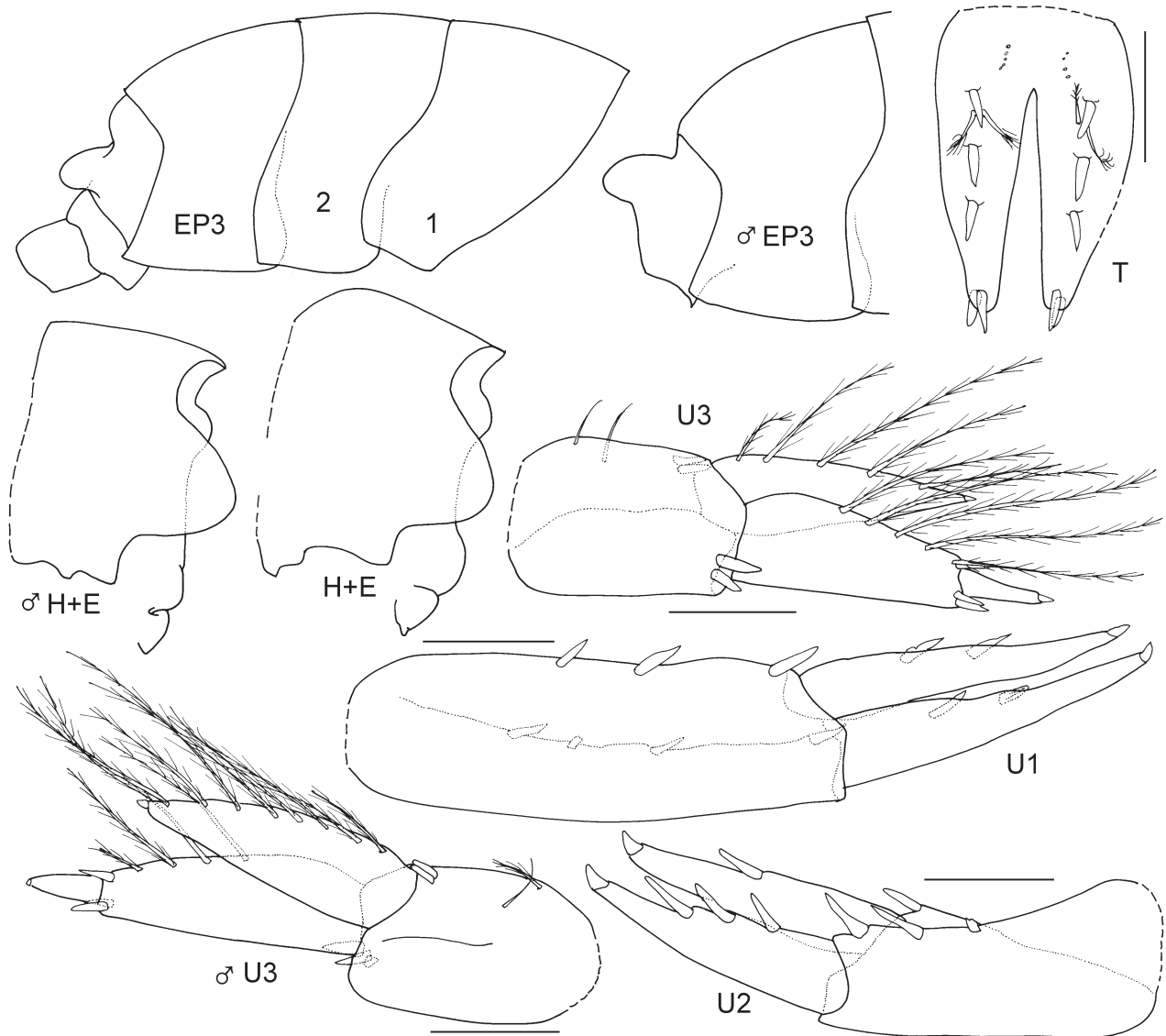


FIGURE 46. *Tryphosella toowoomba* **sp. nov.** Holotype, female, 4.4 mm, QM W29089; paratype, male, 2.0 mm, QM W29090; Moreton Bay, Queensland. Scales represent 0.1 mm.

***Tryphosella tuckanarra* sp. nov.**
(Figs 47–49)

Type material. HOLOTYPE, female, ovigerous, 3.1 mm, AM P.70523, Vancouver Peninsula, near Mistaken Island, King George Sound, Western Australia, Australia, 35°04'S 117°56'E, 2 m, grey sponge with crinoids, 13 December 1983, R.T. Springthorpe, stn WA-114. PARATYPES: 1 immature, AM P.70524, same data as Holotype; 1 juvenile, AM P.70498, Vancouver Peninsula, near Mistaken Island, King George Sound, Western Australia, Australia, 35°04'S 117°56'E, 2 m, sponges, 13 December 1983, J.K. Lowry, stn WA-101; 1 male, 3.1 mm, AM P.70499, same data, stn WA-103; 4 specimens, AM P.70500, same locality, 2 m, soft corals and *Caulerpa*, 13 December

1983, J.K. Lowry, stn WA-106; 1 specimen, AM P.70525, same locality, 2 m, sponge covered with short green alga (?*Caulerpa*), 13 December 1983, R.T. Springthorpe, stn WA-119; 1 ovigerous female, 3.4 mm, AM P.70526 and 1 ovigerous female, AM P.70527, same locality, 6 m, sea grass, 13 December 1983, R.T. Springthorpe, stn WA-121.

Additional material examined. *Western Australia*: 1 ovigerous female and 1 immature, AM P.70528, off Possession Point, King George Sound, 35°02.5'S 117°55'E, 7 m, mixed brown algae, bryozoans, sponge, R.T. Springthorpe & J.K. Lowry, 14 December 1983, stn WA-133; 2 juveniles, AM P.70529, rocks near Migo Island, Port Harding, Torbay Bay, 35°04'S 117°39'E, 6–7 m, small branched alga with compound tunicate on underside of branches, 15 December 1983, R.T. Springthorpe & J.K. Lowry, stn WA-152.

Type locality. Vancouver Peninsular, near Mistaken Island, King George Sound, Western Australia, Australia, 35°04'S 117°56'E, 2 m depth.

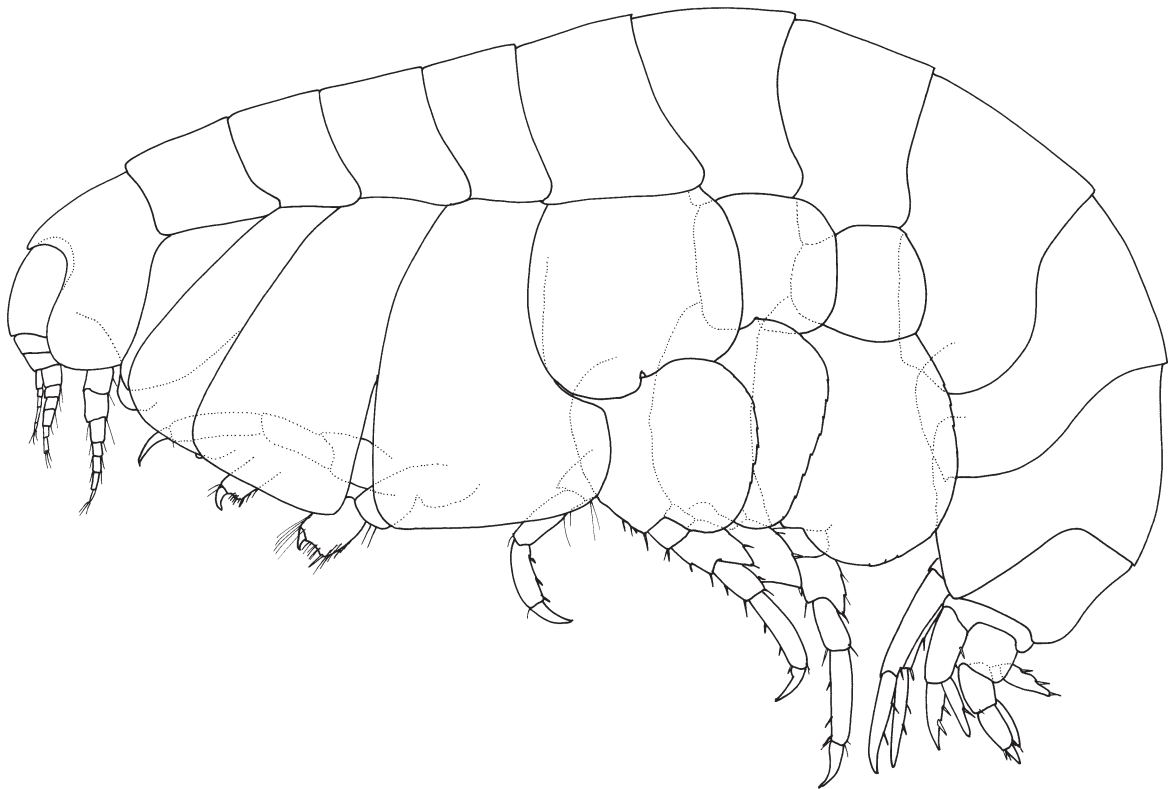


FIGURE 47. *Tryphosella tuckanarra* sp. nov. Paratype, female, 3.4 mm, AM P.70526, King George Sound, Western Australia.

Etymology. Named for the tiny village of Tuckanarra located about about 580 km north-northeast from Perth.

Diagnostic description. *Head* lateral cephalic lobe subtriangular, apically subacute; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with weak 2-field calynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 short; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* epistome slightly produced beyond upper lip, narrowly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7 left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of curved inner margin; palp distal margin with apical robust setae. *Maxilliped* outer plate with 2 short apical robust setae.

Gnathopod 1 subchelate; *coxa* medium length (length 1.5 x breadth), subtriangular, tapering distally; basis moderately setose along anterior margin; ischium short; carpus long, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, sparsely setose along posterior margin, palm slightly acute, entire, straight. *Gnathopod 2* palm transverse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis about as long as broad, not posteroproximally excavate, posterior margin not serrate. *Pereopod 7* basis posterodistally produced less than half-way along merus, not posterodistally excavate.

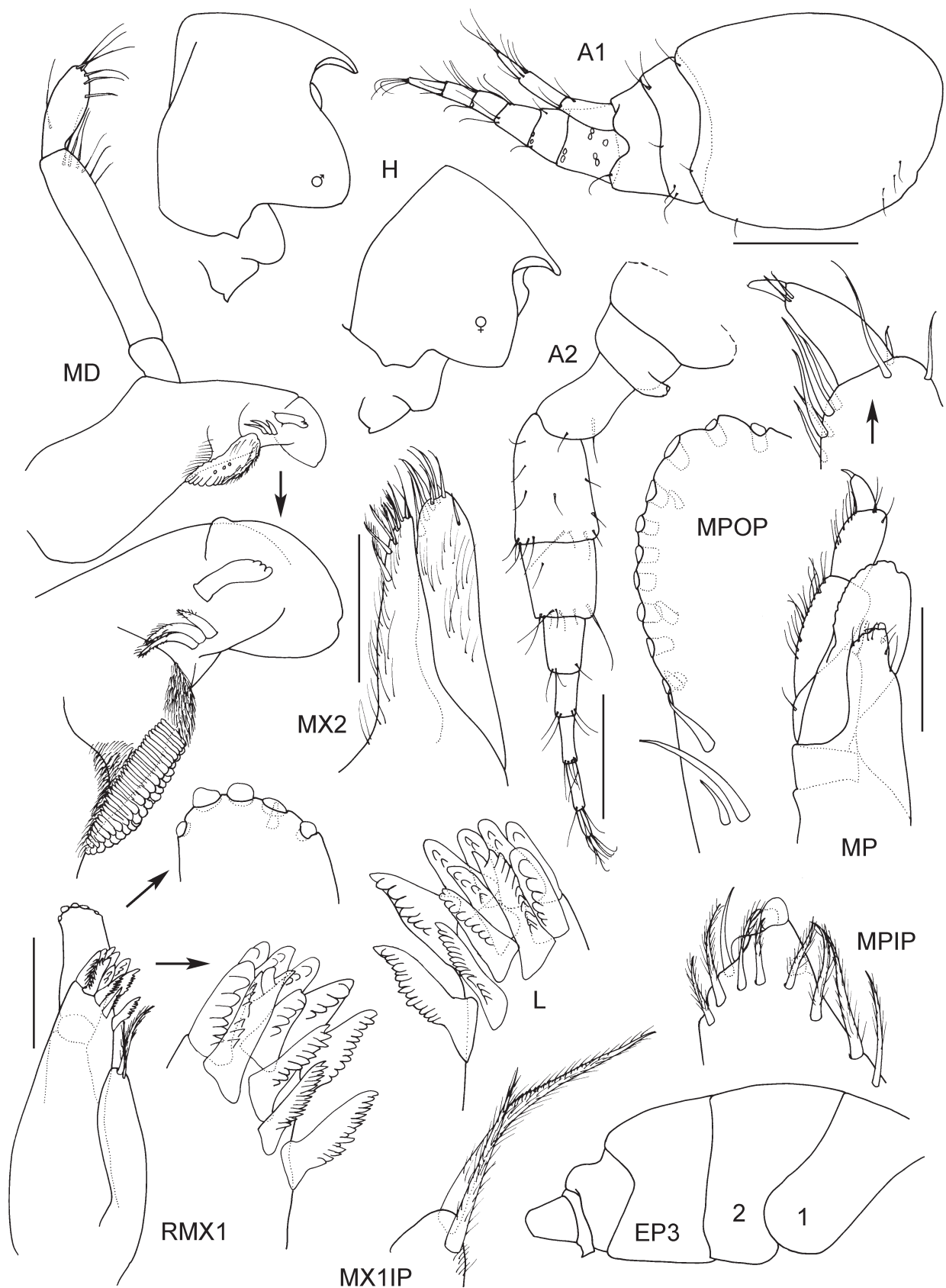


FIGURE 48. *Tryphosella tuckanarra* sp. nov. Holotype, female, 3.1 mm, AM P.70523; paratype male, 3.1 mm, AM P.70499; King George Sound, Western Australia. Scales represent 0.1 mm.

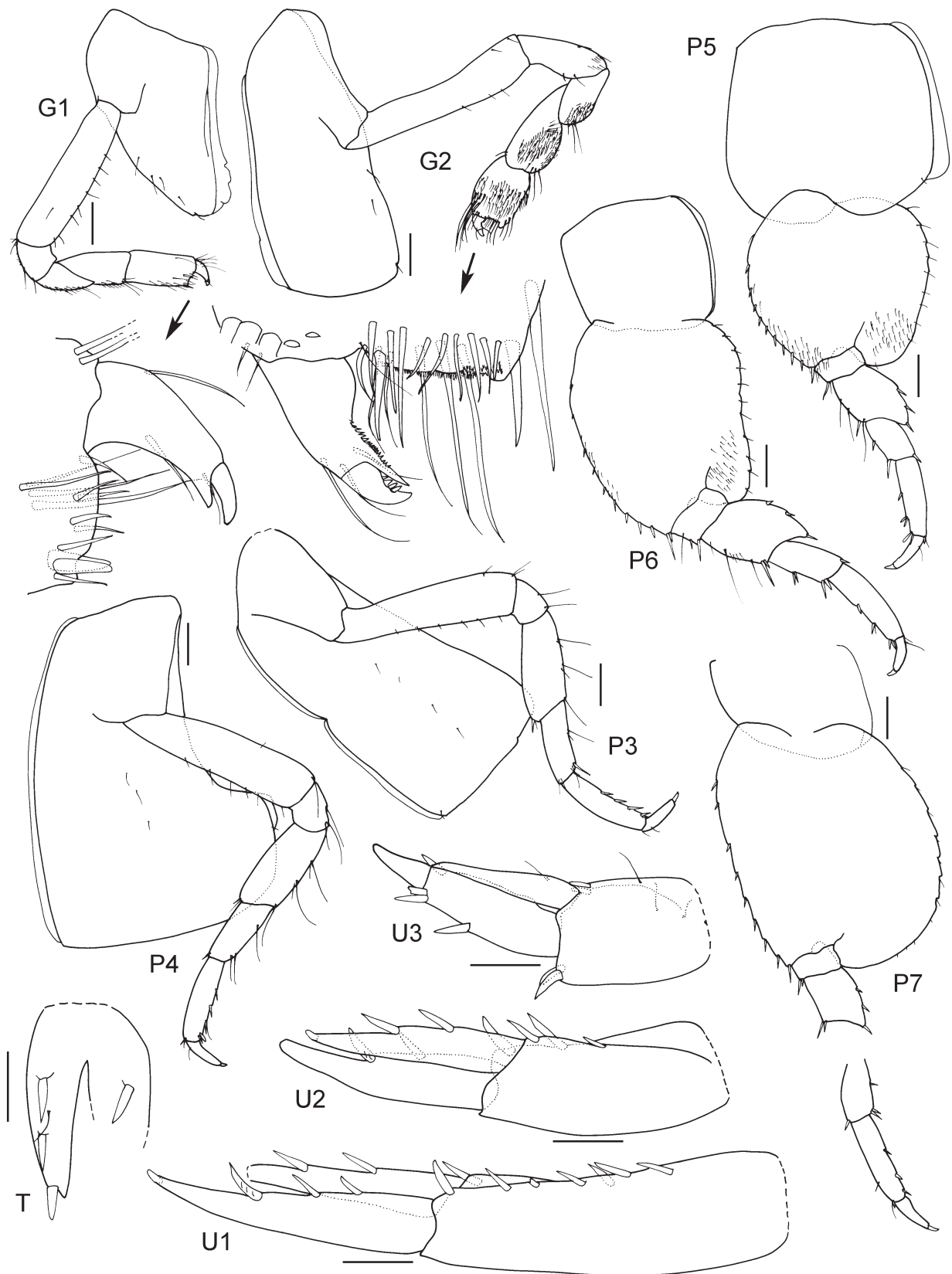


FIGURE 49. *Tryphosella tuckanarra* sp. nov. Holotype, female, 3.1 mm, AM P.70523, King George Sound, Western Australia. Scales represent 0.1 mm.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. *Epimeron 3* posterior margin smooth, **posteroventral corner subquadrate**. *Urosomite 1* not projecting over urosomite 2, **with rounded boss**. *Uropods 1 and 2* rami with distal stout striated robust setae. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange, with 2 short apicomedial robust setae; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. *Telson* deeply cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). *Antenna 1* calceoli present. *Antenna 2* flagellum long, calceoli present. Unfortunately a fully-developed male is not present in the collections.

Remarks. *Tryphosella tuckanarra* is one of the group of six Australian species with stout striated robust setae on the outer rami of uropods 1 and 2 (see Remarks under *T. fortescue*). *Tryphosella tuckanarra* is very similar to *T. fortescue* in having a transverse palm on gnathopod 2, 2 short apicomedial robust setae on the peduncle of uropod 3 and 2 apical robust setae on each lobe of the telson. *Tryphosella tuckanarra* is distinguished from *T. fortescue* by the rounded lateral cephalic lobe (subtriangular in *T. fortescue*), the less reduced coxa 1 and the presence of 2 apical robust setae on the outer plate of the maxilliped (3 in *T. fortescue*).

Tryphosella tuckanarra is known only from King George Sound and Torbay Bay in shallow-water. It has never been taken in traps.

Distribution. South-western Western Australia, 2–7 m depth.

Tryphosella wangeratta sp. nov.

(Figs 50–52)

Type material. HOLOTYPE, male, 5.2 mm, MV J62291, Crib Point, Western Port, Victoria, Australia, 38°21.15'S 145°14.44'E, 12 m, sand, Smith-McIntyre grab, 25 February 1965, Marine Studies Group, Fisheries and Wildlife Department, Ministry for Conservation, Victoria, CPBS stn 31E. PARATYPES: 1 female, with setose oostegites, 5.0 mm, MV J3509, Crib Point, Western Port, Victoria, Australia, 38°20.25'S 145°14.69'E, 11 m, sand, Smith-McIntyre grab, 10 March 1965, Marine Studies Group, Fisheries and Wildlife Department, Ministry for Conservation, Victoria, CPBS stn 25N; 1 female, MV J3503, same locality and collector, 38°19.98'S 145°15.13'E, 2 m, mud and *Zostera*, Smith-McIntyre grab, 16 March 1965, CPBS stn 12N; 1 female and 1 immature, MV J3506, same locality and collector, 38°20.60'S 145°13.46'E, 13 m, shelly sand, Smith-McIntyre grab, 18 March 1965, CPBS stn 22N; 1 male, 1 ovigerous female and 2 immatures, MV J3508, same locality and collector, 38°20.67'S 145°14.74'E, 9 m, sand, Smith-McIntyre grab, 4 March 1965, CPBS stn 24N; 1 female and 1 immature, MV J3514, same locality and collector, 38°20.83'S 145°13.49'E, 13 m, sandy gravel, Smith-McIntyre grab, 23 March 1965, CPBS stn 32N.

Type locality. Crib Point, Western Port, Victoria, Australia, 38°21.15'S 145°14.44'E, 12 m depth.

Etymology. Named for the rural city of Wangeratta in north-eastern Victoria.

Diagnostic description. **Head lateral cephalic lobe rounded**, apically rounded; eyes apparently absent. *Antenna 1* peduncular articles 1 and 2 without anterodistal lobe; accessory flagellum not forming cap, terminal article not offset; flagellum with strong 2-field calynophore, robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 long; articles 4 and 5 not enlarged; flagellum short, calceoli absent. *Epistome/Upper lip* separate; epistome produced beyond upper lip, narrowly rounded; upper lip slightly produced, straight. *Mandible* molar with asymmetrically reduced column, proximally setose, distally triturating; palp attached about midway, article 3 with proximal A3-seta. *Maxilla 1* outer plate setal-tooth 7, left and right asymmetrical, left cuspidate along most of sinusoidal inner margin, right cuspidate along most of weakly sinusoidal inner margin; palp distal margin with apical robust setae. *Maxilliped* basis without recurved hook; outer plate with 1 short apical robust seta.

Gnathopod 1 subchelate; **coxa medium length (length 1.7 x breadth), subtriangular, tapering distally**; basis sparsely setose along anterior margin; ischium short; carpus long, subequal in length to propodus, without posterior lobe; propodus small, margins subparallel, palm moderately acute, entire, straight. *Gnathopod 2* palm moderately obtuse. *Pereopod 4* coxa without distinct lateral ridge, with a well-developed posteroventral lobe. *Pereopod 5* coxa without distinct lateral ridge, without umbo; basis longer than broad, without photophore, not postero proximally excavate, posterior margin weakly serrate, posterior margin with mid-central spine, without posteroventral lobe or spine. *Pereopod 7* basis posterodistally produced less than halfway along merus, not posterodistally excavate.

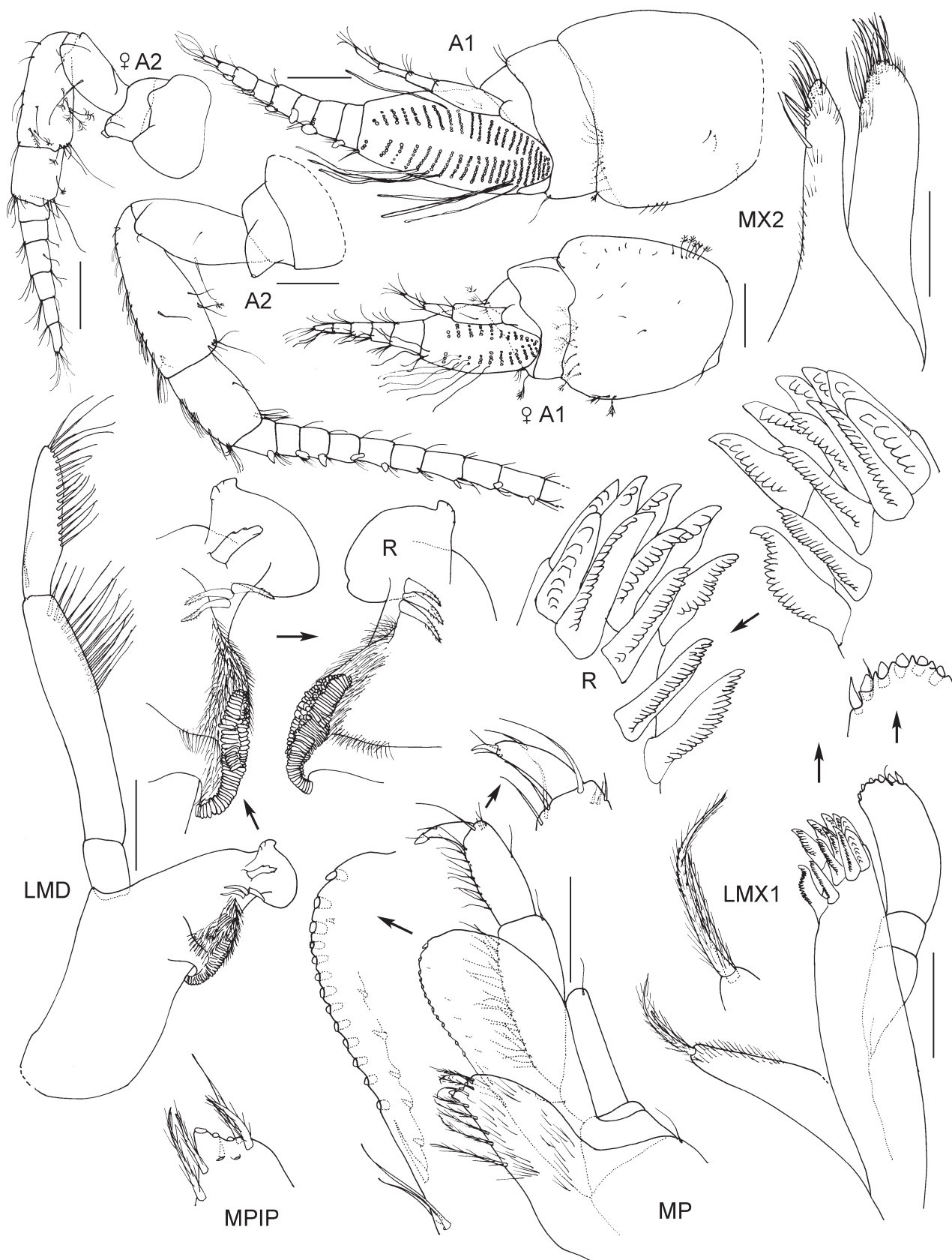


FIGURE 50. *Tryphosella wangeratta* **sp. nov.** Holotype, male, 5.2 mm, MV J62291; paratype, female, 5.0 mm, MV J3509; Crib Point, Western Port, Victoria. Scales represent 0.1 mm.

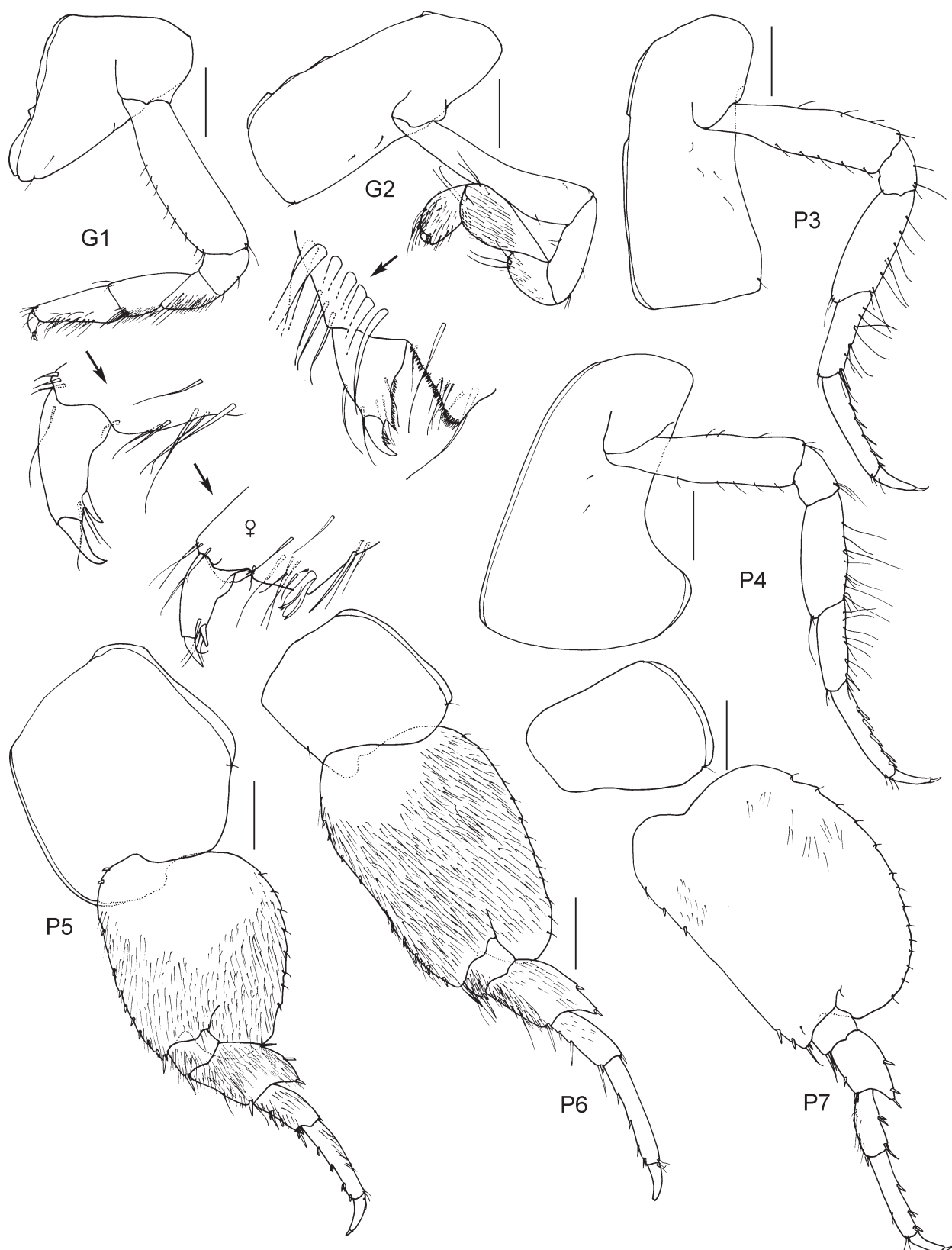


FIGURE 51. *Tryphosella wangaratta* **sp. nov.** Holotype, male, 5.2 mm, MV J62291; paratype, female, 5.0 mm, MV J3509; Crib Point, Western Port, Victoria. Scales represent 0.2 mm.

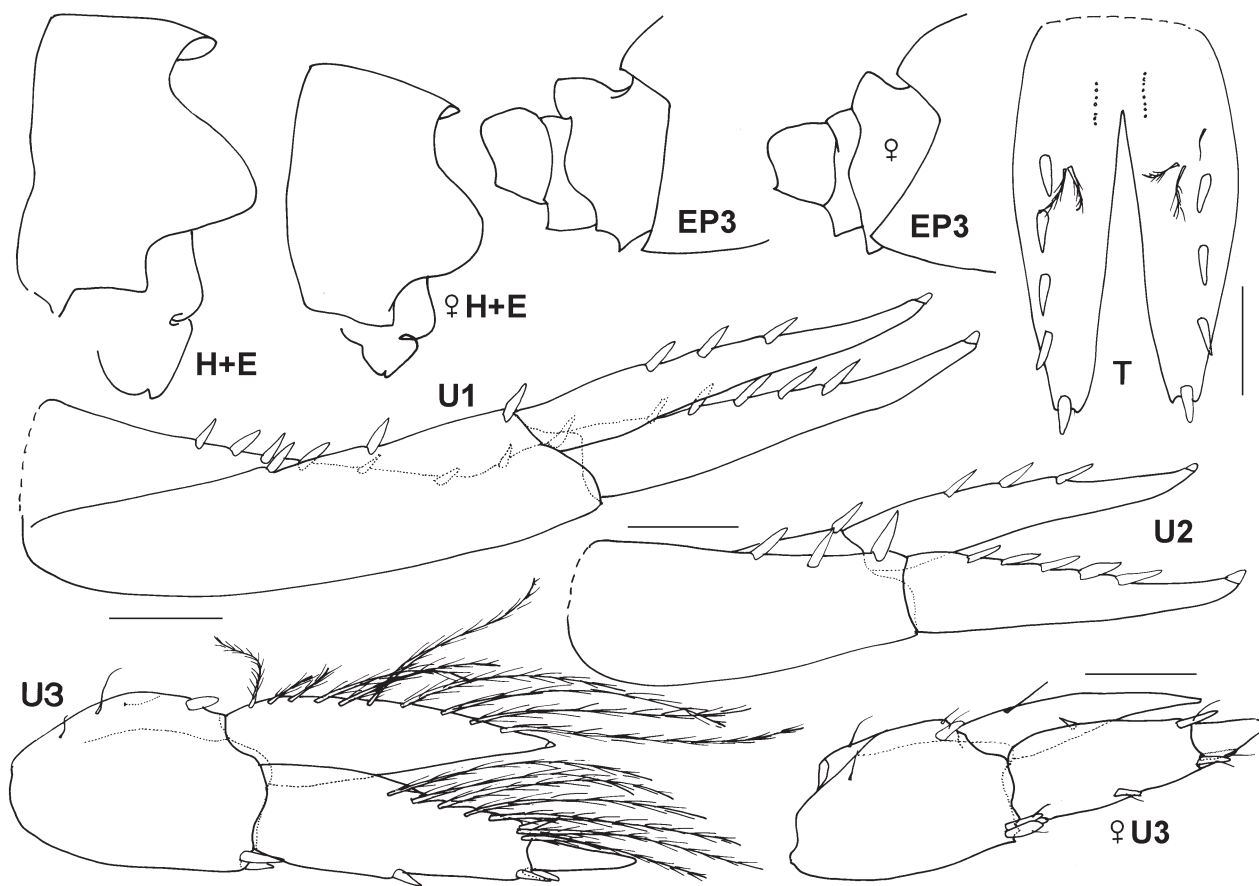


FIGURE 52. *Tryphosella wangaratta* sp. nov. Holotype, male, 5.2 mm, MV J62291; paratype, female, 5.0 mm, MV J3509; Crib Point, Western Port, Victoria. Scales represent 0.2 mm.

Pleonites 1–3 without mid-dorsal carina, not produced dorsodistally. *Epimeron 3* posterior margin smooth, **posteroventral corner acutely produced**. *Urosomite 1* not projecting over urosomite 2, with deep notch and subtriangular, subacute boss. *Uropods 1* and *2* outer rami without stout striated robust setae. *Uropod 2* inner ramus without constriction. *Uropod 3* peduncle without dorsolateral flange, **with 1 short apicomedial robust seta**; inner and outer rami well developed, outer ramus article 2 short, without plumose setae on rami. *Telson* deeply cleft, with dorsal robust setae, **with 1 apical robust seta on each lobe**.

Male (sexually dimorphic characters). *Head* lateral cephalic lobe subtriangular. *Antenna 1* calceoli present, small. *Antenna 2* peduncular articles 4 and 5 enlarged; flagellum long, calceoli present. *Epistome/Upper lip* epistome produced equally with upper lip. **Gnathopod 1 simple**; propodus margins tapering distally, palm absent. *Urosomite 1* with wedge-shaped boss, obliquely truncated apically. *Uropod 3* with plumose setae on both rami.

Remarks. *Tryphosella wangaratta* belongs to the group of Australian species (*T. betka*, *T. martrudan*, *T. too-woomba* and *T. wangaratta*) in which the male gnathopod 1 is simple. See Remarks for each of these species.

Tryphosella wangaratta is only known from shallow-water in Western Port. It has never been taken in traps.

Distribution. Western Port, Victoria, Australia; 2–14 m depth.

Acknowledgements

The main collections for this study were made by trapping along the east coast of Australia during the SEAS project, Australian Museum (Lowry & Smith 2003). We thank Stephen Keable (AM), Gary Poore and David Staples (MV), Peter Davie (QM), Wolfgang Zeidler and Thierry Laperousaz (SAM) and Andrew Hosie (WAM) for the loan and processing of material used in this study. We thank Arundathi Bopiah, Rachael Peart and Roger Springthorpe who produced our plates and particularly the late Sharne Wiedland who provided the water colour of *Photosella miersi* and the pencil drawing of *Photosella charlotteae*. We thank Peter Ng who advised us on the ‘precedence of

names' problem and Mike Thurston for his careful editing and astute comments which significantly improved the manuscript. The study was initially funded by ARC and more recently by ABRS which has allowed Helen Stoddart's participation.

References

- *Andres, H.G. (1983) Die Gammaridea (Crustacea: Amphipoda) der Deutschen Antarktis-Expeditionen 1975/76 und 1977/78. 3. Lysianassidae. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 80, 183–220.
- *Arnaud, P.M. (1974) Contribution a la bionomie marine benthique des régions antarctiques et subantarctiques. *Téthys*, 6, 465–656.
- Barnard, J.L. (1958) Index to the families, genera, and species of the gammaridean Amphipoda (Crustacea). *Allan Hancock Foundation Publications, Occasional Paper*, 19, 1–145.
- Barnard, J.L. (1962) South Atlantic abyssal amphipods collected by R.V. Vema. *Abyssal Crustacea. Vema Research Series*, 1, 1–78.
- Barnard, J.L. (1966) Submarine canyons of southern California. Part V. Systematics: Amphipoda. *Allan Hancock Pacific Expeditions*, 27, 1–166.
- Barnard, J.L. (1969) The families and genera of marine gammaridean Amphipoda. *Bulletin of the United States National Museum*, 271, 1–535.
- *Barnard, J.L. (1972) Gammaridean Amphipoda of Australia, Part I. *Smithsonian Contributions to Zoology*, 103, 1–333.
- Barnard, J.L. & Karaman, G.S. (1987) Revisions in classification of gammaridean Amphipoda (Crustacea), Part 3. *Proceedings of the Biological Society of Washington*, 100(4), 856–875.
- *Barnard, J.L. & Karaman, G.S. (1991) The families and genera of marine gammaridean Amphipoda (except marine gammaroids). *Records of the Australian Museum, Supplement*, 13(1 & 2), 1–866.
- Barnard, K.H. (1916) Contributions to the crustacean fauna of South Africa. 5. -The Amphipoda. *Annals of the South African Museum*, 15, 105–302, pls 26–28.
- Barnard, K.H. (1932) Amphipoda. *Discovery Reports*, 5, 1–326, pl. 321.
- *Bellan-Santini, D. (1997) Amphipods of the cold seep community on the South Barbados Accretionary Prism. *Crustaceana*, 70, 1–30.
- Boeck, A. (1871) Crustacea Amphipoda borealia et arctica. *Forhandlinger i Videnskabs-Selskabet i Christiania*, 1870, 81–280, i–viii [index].
- Bonnier, J. (1893) Les amphipodes du Boulonnais (1). *Bulletin Scientifique de la France et de la Belgique*, 24, 161–207, pls 5–8.
- Bonnier, J. (1896) Résultats Scientifiques de la Campagne du "Caudan" dans la Golfe de Gascogne - Aout-Septembre 1895. Edriophthalmes. *Annales de l'Université de Lyon*, 26, 527–689, pls 528–540.
- *Bryazgin, V.F. (1974) [Species of the family Lysianassidae (Amphipoda, Gammaridea) first recorded for the Barents Sea]. *Zoologicheskij Zhurnal*, 53, 1570–1574.
- *Buhl-Jensen, L. & Fosså, J.H. (1991) Hyperbenthic crustacean fauna of the Gullmarfjord area (western Sweden): species richness, seasonal variation and long-term changes. *Marine Biology*, 109, 245–258.
- Chevreaux, E. (1926) Diagnoses d'amphipodes nouveaux provenant des campagnes de la "Princesse-Alice", dans l'Atlantique et dans l'Océan Arctique. Lysianassidae. *Bulletin de l'Institut Océanographique, Monaco*, 475, 1–12.
- Chilton, C. (1921) Report on the Amphipoda obtained by the F.I.S. "Endeavour" in Australian seas. *Biological Results of the Fishing Experiments carried on by the F.I.S. "Endeavour", 1909-14*, 5, 33–92.
- *Costello, M.J., Holmes, J.M.C., McGrath, D. & Myers, A.A. (1989) A review and catalogue of the Amphipoda (Crustacea) in Ireland. *Irish Fisheries Investigations, Series B, Marine*, 33, 1–70.
- Dallwitz, M.J. (2005) Overview of the DELTA System. <http://delta-intkey.com/www/overview.htm>. (8/9/2007).
- Dana, J.D. (1849) Synopsis of the genera of Gammaracea. *American Journal of Science and Arts, Series 2*, 8, 135–140.
- *Dauvin, J.-C. & Toulemont, A. (1988) Données préliminaires sur les amphipodes de l'Iroise et de ses abords, leurs affinités biogéographiques. *Aspects Récents de la Biologie des Crustacés. Actes de Colloques, IFREMER*, 8, 217–221.
- *De Broyer, C., Lowry, J.K., Jazdzewski, K. & Robert, H. (2007) Catalogue of the Gammaridean and Corophiidean Amphipoda (Crustacea) of the Southern Ocean with distribution and ecological data. In: C. De Broyer (Ed), *Census of Antarctic Marine Life: Synopsis of the Amphipoda of the Southern Ocean. Volume 1. Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Biologie*, pp. 1–325.
- De Broyer, C., Nyssen, F. & Dauby, P. (2004) The crustacean scavenger guild in Antarctic shelf, bathyal and abyssal communities. *Deep-Sea Research Part II-Topical Studies in Oceanography*, 51, 1733–1752.
- Della Valle, A. (1893) Gammarini del Golfo di Napoli. *Fauna und Flora des Golfes von Neapel*, 20, 1–948, pls 1–61.
- *Diviacco, G. & Ruffo, S. (1989) Family Lysianassidae. In: S. Ruffo (Ed), *The Amphipoda of the Mediterranean. Part 2. Gammaridea (Haustoriidae to Lysianassidae). Mémoires de l'Institut Océanographique, Monaco*, pp. 469–576.
- Gurjanova, E. (1929) Neue Formen arktischer Isopoden und Amphipoden. *Zoologischer Anzeiger*, 81(11/12), 309–317.
- *Gutt, J., Sirenko, B.I., Arntz, W.E., Smirnov, I.S. & De Broyer, C. (2000) Biodiversity of the Weddell Sea: macrozoobenthic species (demersal fish included) sampled during the expedition ANT XIII/3 (EASIZ I) with RV "Polarstern". *Berichte zur Polarforschung*, 372, 1–103.
- Hurley, D.E. (1963) Amphipoda of the family Lysianassidae from the west coast of North and Central America. *Allan Hancock Foundation Publications, Occasional Paper*, 25, 1–160.

- Hurley, D.E. (1965) A re-description of some A.O. Walker types of "Southern Cross" Lysianassidae (Crustacea Amphipoda) from the Ross Sea. *Transactions of the Royal Society of New Zealand, Zoology*, 6, 155–181.
- Hutchings, P., Van Der Velde, J.T. & Keable, S.J. (1989) Baseline survey of the benthic macrofauna of Twofold Bay, N.S.W., with a discussion of the marine species introduced into the bay. *Proceedings of the Linnean Society of New South Wales*, 110, 339–367.
- ICZN [International Commission on Zoological Nomenclature] (1999) *International Code of Zoological Nomenclature*. Fourth Edition adopted by the International Union of Biological Sciences. The International Trust for Zoological Nomenclature, the Natural History Museum, London. xxix pp, 306 pp.
- Jones, D.S. (1986) A catalogue of type specimens of Crustacea in the Western Australian Museum, Perth. *Records of the Western Australian Museum*, 13, 1–46.
- Keable, S.J. (1995) Structure of the marine invertebrate scavenging guild of a tropical reef ecosystem: field studies at Lizard Island, Queensland, Australia. *Journal of Natural History*, 29(1), 27–45.
- *Kilgallen, N.M. (2009) New species of lysianassoid Amphipoda (Crustacea) associated with seamounts, marine canyons and cold seeps of New Zealand. *Zootaxa*, 2298: 1–30.
- *Kilgallen, N.M., Myers, A.A. & McGrath, D. (2006) A review of the genus *Tryphosella* (Crustacea : Amphipoda) from Britain and Ireland, with the description of a new species *Tryphosella lowryi*. *Journal of the Marine Biological Association of the United Kingdom*, 86(5), 1067–1081.
- Krøyer, H.N. (1838) Conspectus Crustaceorum Groenlandiae. *Naturhistorisk Tidsskrift, Series I*, 2, 249–261.
- Lagardère, J.P. (1968) Les crustacés de l'expédition française R.C.P. 42 au Spitzberg (été 1966). *Bulletin du Centre d'Etudes et de Recherches Scientifiques de Biarritz*, 7(2), 155–205.
- Lilljeborg, W. (1865) Bidrag till kannedomen om underfamilien Lysianassina inom underordningen Amphipoda bland kraftdjuren. *Uppsala Universitets Årsskrift*, 1865, 1–25.
- *Lincoln, R.J. (1979) *British Marine Amphipoda: Gammaridea*. British Museum (Natural History), London. i–v, 658 pp.
- *Lowry, J.K. & Bullock, S. (1976) Catalogue of the marine gammaridean Amphipoda of the Southern Ocean. *Royal Society of New Zealand Bulletin*, 16, 1–187.
- Lowry, J.K. & Smith, S.D.A. (2003) *Invertebrate scavenging guilds along the continental shelf and slope of eastern Australia – general description*. Australian Museum, Sydney, 59 pp.
- *Lowry, J.K. & Stoddart, H.E. (1983) The shallow-water gammaridean Amphipoda of the subantarctic islands of New Zealand and Australia: Lysianassoidea. *Journal of the Royal Society of New Zealand*, 13, 279–394.
- *Lowry, J.K. & Stoddart, H.E. (1994) Crustacea Amphipoda: Lysianassoids from the tropical western South Pacific Ocean. *Mémoires du Muséum National d'Histoire Naturelle, Series A, Zoology*, 161, 127–223.
- *Lowry, J.K. & Stoddart, H.E. (1995) The Amphipoda (Crustacea) of Madang Lagoon: Lysianassidae, Opisidae, Uristidae, Wandinidae and Stegocephalidae. *Records of the Australian Museum, Supplement*, 22, 97–174.
- Lowry, J.K. & Stoddart, H.E. (1997) Amphipoda Crustacea IV. Families Aristiidae, Cyphocarididae, Endeavouridae, Lysianassidae, Scopelocheiridae, Uristidae. *Memoirs of the Hourglass Cruises*, 10, 1–148.
- *Lowry, J.K. & Stoddart, H.E. (2003) Crustacea: Malacostraca: Peracarida: Amphipoda, Cumacea, Mysidacea. In: Beesley, P.L. & Houston, W.W.K. (Eds), *Zoological Catalogue of Australia*, 19.2B, Melbourne: CSIRO Publishing, xii, 531 pp.
- *Lowry, J.K. & Stoddart, H.E. (2009) Lysianassidae. pp 561–597 in: Lowry, J.K. & Myers, A.A. (eds) *Benthic Amphipoda (Crustacea: Peracarida) of the Great Barrier Reef, Australia*. *Zootaxa*, 2260, 1–930.
- Meinert, F. (1890) Crustacea Malacostraca. *Det Videnskabelige Udbytte af Kanonbaaden "Hauch" Togter i de Danske Have indenfor Skagen i Aarene 1883–86*, 3, 149–232, pls 1, 2, Atlas.
- Miskov-Nodland, K., Buhl-Mortensen, L. & Hoisaeter, T. (1999) Has the fauna in the deeper parts of the Skagerrak changed?: A comparison of the present amphipod fauna with observations from 1933/37. *Sarsia*, 84, 137–155.
- *Moore, P.G. (1984) The fauna of the Clyde Sea area. Crustacea: Amphipoda. *University Marine Biological Station Millport, Occasional Publication*, 2, 1–84.
- Norman, A.M. (1900) British Amphipoda: Fam. Lysianassidae (concluded). *Annals and Magazine of Natural History, Series 7*, 5, 196–214, pl. 196.
- *Oleröd, R. (1987) *Tmetonyx norbiensis* sp. n. and *Tryphosella abyssalis* (Stephensen, 1925), two deep-sea lysianassids from the Norwegian Sea (Crustacea, Amphipoda). *Sarsia*, 72, 143–158.
- *Palerud, R. & Vader, W. (1991) Marine Amphipoda Gammaridea in north-east Atlantic and Norwegian Arctic. *Tromsø, Naturvitenskap*, 68, 1–97.
- Pirlot, J.M. (1936) Les amphipodes de l'expédition du Siboga. Deuxième partie: Les amphipodes gammarides, II. - Les amphipodes de la mer profonde. 3: Addendum et partie générale. III. - Les amphipodes littoraux. 1: Lysianassidae, Ampeliscidae, Leucothoidae, Stenothoidae, Phliantidae, Colomastigidae, Ochlesidae, Liljeborgiidae, Oedicerotidae, Synopiidae, Eusiridae, Gammaridae. *Siboga-Expeditie, Monographie*, 33e, 237–328.
- *Ren, X. & Huang, L. (1991) [Studies on Gammaridea and Caprellidea (Crustacea: Amphipoda) from the northwest waters of the Antarctic Peninsula]. *Studia Marina Sinica*, 32, 187–323.
- *Ruffo, S. (1985) Studi sui crostacei anfipodi. CII. Le specie mediterranee dei generi *Tmetonyx* Stebbing e *Tryphosella* Bonnier (Crustacea, Amphipoda, Lysianassidae). *Annali del Museo Civico di Storia Naturale, Genova*, 85, 273–297.
- Sars, G.O. (1879) Crustacea et Pycnogonida nova in itinere 2do et 3tio expeditionis Norvegicae anno 1877 & 78 collecta (Prodromus descriptionis). *Archiv for Mathematik og Naturvidenskab, Kristiania*, 4, 427–476.
- Sars, G.O. (1883) Oversigt af Norges Crustaceer med foreløbige Bemaerkninger over de nye eller mindre bekjendte Arter, I: (Podophthalmata-Cumacea-Isopoda-Amphipoda). *Forhandlinger i Videnskabs-Selskabet i Christiania*, 18, 1–124, pls 1–6.
- Sars, G.O. (1891) *An Account of the Crustacea of Norway, with Short Descriptions and Figures of all the Species. Vol. I.*

- Amphipoda. Parts 4-9.* Alb. Cammermeyer, Christiana. 69–212 pp, pls 25–72.
- Sars, G.O. (1895) *An Account of the Crustacea of Norway with Short Descriptions and Figures of all the Species. Vol. 1. Amphipoda. Parts 31, 32, Appendix.* Alb. Cammermeyer, Christiana. 673–711, suppl. pls. 1–8.
- Schellenberg, A. (1926) Die Gammariden der Deutschen Südpolar-Expedition 1901-1903. *Deutsche Südpolar-Expedition*, 18, 235–414.
- Schellenberg, A. (1931) Gammariden und Caprelliden des Magellangebietes, Sudgeorgiens und der Westantarktis. *Further Zoological Results of the Swedish Antarctic Expedition 1901-1903*, 2, 1–290, pl. 291.
- Schellenberg, A. (1935) Die Amphipoden der Norwegischen Expeditionen nach Ost-Grönland in den Jahren 1929, 1930, 1931 und 1932. *Skrifter om Svalbard og Ishavet, Oslo*, 66, 9–39.
- Sergeev, V.N., Clarke, S.M. & Shepherd, S.A. (1988) Motile macroepifauna of the seagrasses, *Amphibolis* and *Posidonia*, and unvegetated sandy substrata in Holdfast Bay, South Australia. *Transactions of the Royal Society of South Australia*, 112, 97–108.
- Sheard, K. (1937) A catalogue of Australian Gammaridea. *Transactions and Proceedings of the Royal Society of South Australia*, 61, 17–29.
- Springthorpe, R.T. & Lowry, J.K. (1994) Catalogue of crustacean type specimens in the Australian Museum: Malacostraca. *Technical Reports of the Australian Museum*, 11, 1–134.
- Stebbing, T.R.R. (1888) Report on the Amphipoda collected by H.M.S. Challenger during the years 1873-1876. *Report on the Scientific Results of the Voyage of H.M.S. Challenger during the years 1873-76, Zoology*, 29, 1–1737, pls 1–210.
- Stebbing, T.R.R. (1906) Amphipoda. I. Gammaridea. *Das Tierreich*, 21, 1–806.
- Stebbing, T.R.R. (1910) Scientific results of the trawling expedition of H.M.C.S. "Thetis". Crustacea. Part V. Amphipoda. *Australian Museum Memoir*, 4, 565–658, pls 47–60.
- Stephensen, K. (1921) *Tryphosa Schneideri* an amphipod from northern Norway new to science (Fam. Lysianassidae). *Tromsø Museums Årshefter*, 43, 1–9.
- Stephensen, K. (1923a) Crustacea Malacostraca, V: (Amphipoda, I). *Danish Ingolf-Expedition*, 3(8), 1–100.
- Stephensen, K. (1923b) Revideret fortegnelse over Danmarks arter af Amphipoda (1. Del) (Hyperideae; Gammaridea: Lysianassidae). *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i København*, 76, 5–20.
- Stephensen, K. (1925) Crustacea Malacostraca, VI: (Amphipoda, II). *Danish Ingolf-Expedition*, 3, 101–178.
- Stephensen, K. (1929) Amphipoda. *Die Tierwelt der Nord- und Ostsee*, 14(Xf), 1–188.
- Stephensen, K. (1935) The Amphipoda of N. Norway and Spitsbergen with adjacent waters. *Tromsø Museums Skrifter*, 3, 1–140.
- Stephensen, K. (1940) Marine Amphipoda. *The Zoology of Iceland*, 3(26), 1–111.
- Thurston, M.H. (1974) Crustacea Amphipoda from Graham Land and the Scotia Arc, collected by Operation Tabarin and the Falkland Islands Dependencies Survey, 1944-59. *British Antarctic Survey Scientific Reports*, 85, 1–89.
- *Thurston, M.H. (2002) Benthic Gammaridea (Crustacea: Amphipoda) in the deep sea. *Polskie Archiwum Hydrobiologii*, 47, 353–377.
- Thurston, M.H. & Allen, E. (1969) Type material of the families Lysianassidae, Stegocephalidae, Ampeliscidae and Haustoriidae (Crustacea: Amphipoda) in the collections of the British Museum (Natural History). *Bulletin of the British Museum (Natural History), Series Zoology*, 17, 347–388.
- Walker, A.O. (1903) Amphipoda of the 'Southern Cross' Antarctic Expedition. *Journal of the Linnean Society of London, Zoology*, 29, 38–64, pls 37–11.
- Walker, A.O. (1904) Report on the Amphipoda collected by Professor Herdman, at Ceylon, in 1902. *Ceylon Pearl Oyster Fisheries - 1904- Supplementary Reports*, 17, 229–300, pls 221–228.

APPENDIX. Precedence of the name *Tryphosella* over *Pseudotryphosa*.

Sars, 1891 established the genus *Pseudotryphosa* with two included species, *P. umbonata* (Sars, 1883) and *P. antennipotens* (Stebbing, 1888). *Pseudotryphosa umbonata* was recorded once again by Sars (1895). Stebbing (1906) synonymised *Pseudotryphosa* with *Uristes* Dana, 1849. This synonymy has been generally accepted until now. We do not consider *Pseudotryphosa umbonata*, the type species of the genus *Pseudotryphosa*, to be a species of *Uristes*, but to be a member of the genus currently called *Tryphosella* Bonnier, 1893. We thus consider *Pseudotryphosa* Sars, 1891 to be a synonym of *Tryphosella* Bonnier, 1893. According to Article 23 of the ICZN, *Pseudotryphosa* would have precedence over *Tryphosella*. However, Article 23.9 of the ICZN allows for a reversal of precedence of a junior synonym when the senior synonym has not been used as a valid name after 1899 (Article 23.9.1.1) and the junior synonym "has been used for a particular taxon, as its presumed valid name, in at least 25 works, published by at least 10 authors in the immediately preceding 50 years and encompassing a span of not less than 10 years" (Article 23.9.1.2). The only post-1899 records we have found of the genus *Pseudotryphosa* are as a junior synonym of *Uristes*. They are included in these publications: Stebbing, 1906: 63; K.H. Barnard, 1916: 126; Stephensen, 1923a: 96; Stephensen, 1923b: 16; Stephensen, 1929: 64; Stephensen, 1935: 77; Stephensen, 1940: 12; J.L. Barnard, 1969: 367; Barnard & Karaman, 1991: 538; Palerud & Vader, 1991: 47; Lowry & Stoddart, 2003: 283.

The publications marked with an asterisk in the References fulfil the requirements of Article 23.9.1.2.

As both requirements of Article 23.9.1 are met, and in accordance with Article 23.9.2, *Tryphosella* Bonnier, 1893 is regarded as a valid name and takes precedence over *Pseudotryphosa* Sars, 1891.